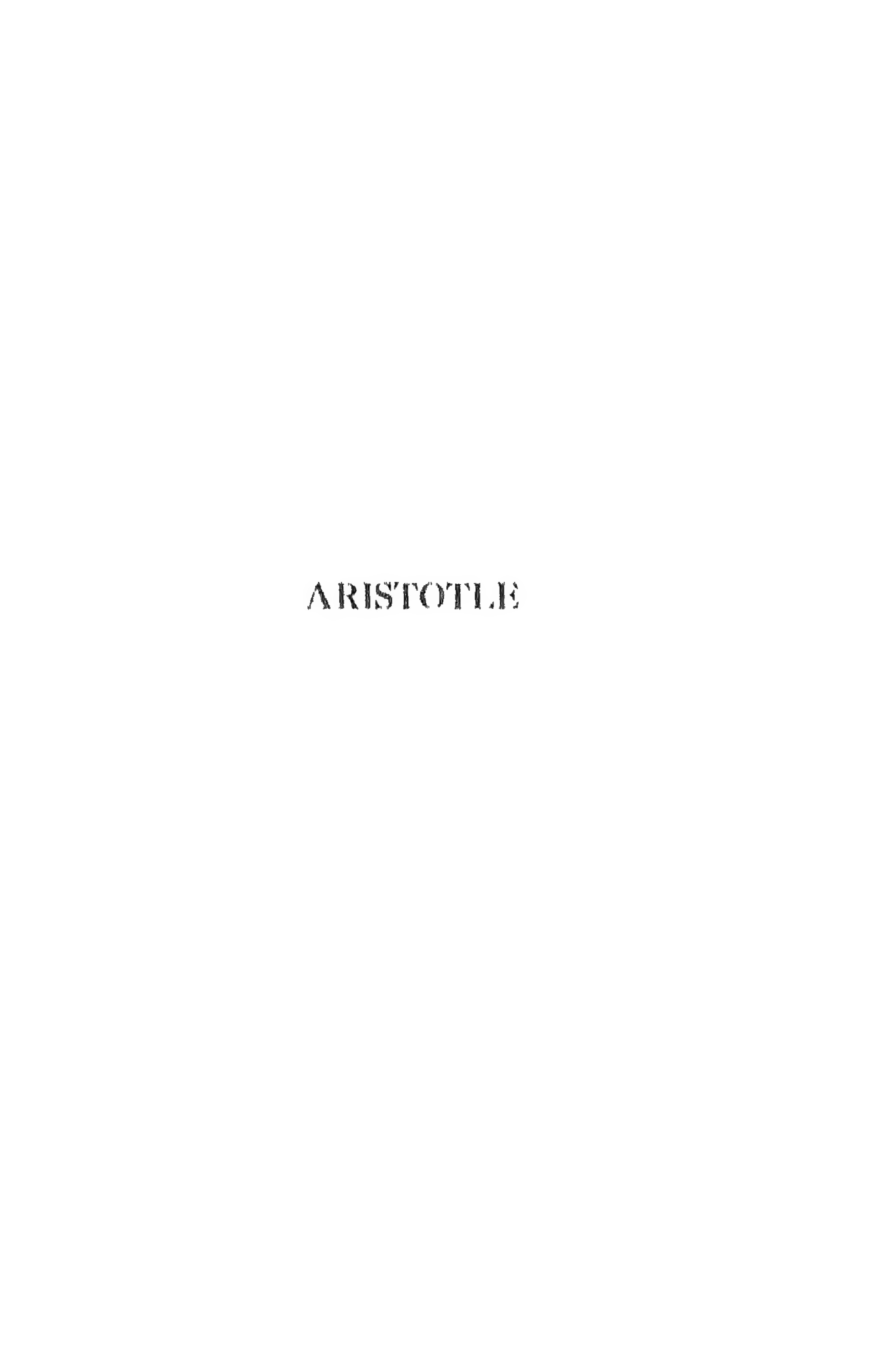
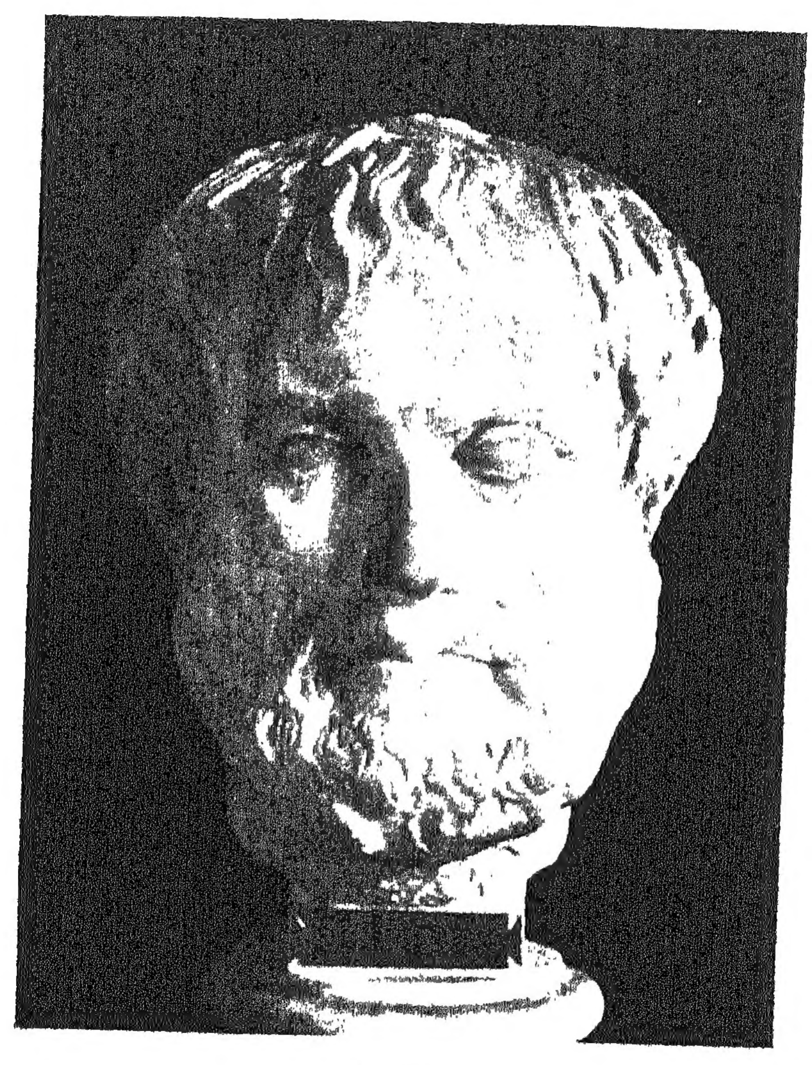

Durga Sah Municipal Library
Naini Tal
Class no. 921
Book no. A74R
Reg no. 6460



ARISTOTLE



ARISTOTLE

BY

W. D. ROSS, M.A.

FELLOW AND TUTOR OF ORIEL COLLEGE; DEPUTY PROFESSOR OF MORAL PHILOSOPHY IN THE UNIVERSITY OF OXFORD

METHUEN & CO. LTD.
36 ESSEX STREET W.C.
LONDON

First Published in [illegible]

PRINTED IN GREAT BRITAIN

PREFACE

THERE are several types of book about Aristotle which it would be interesting to write and perhaps not unprofitable to read. In one, it might be shown how almost the whole of his thought is a mosaic of borrowings from his predecessors, and yet is transformed by the force of his genius into a strikingly original system. In another, the attempt might be made to trace the chronological development of his thought; this has recently been done with marked success by Prof. W. Jaeger, in a book to which I should have owed much more had it reached me before mine was in the press. In another, the penetrating influence of Aristotle on subsequent philosophy might be followed down the centuries. I have not attempted any of these tasks, but have tried simply to give an account of the main features of his philosophy as it stands before us in his works. I have written little by way of criticism. If it is true that 'die Weltgeschichte ist das Weltgericht,' it is especially true that the history of philosophy is an implicit criticism of the earlier systems of thought. What is true in Aristotle has become part, and no small part, of the heritage of all educated men; what is false has been gradually rejected, so that explicit criticism is now hardly necessary.

My greatest obligations are to the teachers from whom I have learnt most of what I know about Aristotle, Mr. R. P. Hardie and Prof. J. A. Smith; next to them, I would express my gratitude to Lt.-Col. A. S. L. Farquharson, who has read the proofs and made many valuable suggestions.

Of recent books, Prof. H. Maier's *Die Syllogistik des Aristoteles*, Prof. A. Mansion's *Introduction à la Physique Aristotélicienne*, and Prof. H. H. Joachim's edition of the *De Generatione et Corruptione* are those which I have found most helpful.

W. D. ROSS

September 15, 1923

CONTENTS

FRONTISPIECE

ARISTOTLE

CHAPTER I

LIFE AND WORKS

The Life of Aristotle[1]

ARISTOTLE was born in 384 B.C. in the little town of Stagira, the modern Stavro, on the north-east coast of the peninsula of Chalcidice. An attempt has sometimes been made[2] to detect a non-Greek strain in his character and to attribute this to his northern birth; but Stagira was in the fullest sense a Greek town, colonized from Andros and Chalcis and speaking a variety of the Ionic dialect. His father, Nicomachus, belonged to the clan or guild of the Asclepiadæ, and it seems probable[3] that the family had migrated from Messenia in the eighth or seventh century. The family of his mother, Phæstis, belonged to Chalcis, where in his last days Aristotle took refuge from his enemies. His father was the physician and friend of Amyntas II of Macedonia, and it is possible that part of Aristotle's boyhood was spent at Pella, the royal seat. It is reasonable to trace Aristotle's interest in physical science and above all in biology to his descent from a medical family. Galen tells us[4] that Asclepiad families trained their sons in dissection, and it is possible that Aristotle had some such training; further, he may have helped his father in his surgery, and this is probably the origin of the story

[1] The main authority for the life of Aristotle is Diogenes Laertius (early third century A.D.). Some information is contained in the First Letter of Dionysius of Halicarnassus (*fl.* 30–8 B.C.) to Ammæus. The other ancient lives are Neo-Platonist or Byzantine. Diogenes' chronology rests for the most part on the authority of Apollodorus of Athens (*fl.* 144 B.C.).

[2] By Bernays and W. von Humboldt.

[3] Cf. Wilamowitz-Möllendorff, *Aristoteles und Athen*, I. 311.

[4] *Anatom. Administr.* ii. 1, vol. ii. 280 K.

which charged him with having been a quack-doctor. His parents died while he was still a boy, and he became the ward of a relation named Proxenus, whose son Nicanor he adopted. In his eighteenth year he entered the school of Plato at Athens, and here he remained for twenty years, until Plato's death. We need not suppose that it was any attraction to the life of philosophy that drew him to the Academy; he was simply getting the best education that Greece could offer. Whatever the motive of his joining the school may have been, it is clear that in Plato's philosophy he found the master-influence of his life. It was impossible that so powerful a mind should accept implicitly all Plato's doctrines. Grave differences on important points became gradually more apparent to Aristotle. But of his philosophical, in distinction from his scientific, works, there is no page which does not bear the impress of Platonism. Even when he attacks particular Platonic doctrines, he often groups himself with those he is criticising and reminds them of their common principles.[1] Like other great men of antiquity, he was not without his calumniators. He was accused in later times of insolent behaviour towards Plato. At one time he stood high in Plato's favour, and was called by him 'the reader' *par excellence*, and 'the mind of the school'; later, as his own point of view became more distinct, their relations may have been less cordial. But while Plato lived Aristotle remained a loyal member of the Academy. In a well-known passage[2] he speaks with delicacy of the unpleasant task of criticising those so dear to him as the Platonic School.

We must not suppose, however, that during these twenty years he was simply a pupil. The ancient schools of philosophy were bodies of men united by a common spirit and sharing the same fundamental views, but following out their own enquiries in comparative independence. In particular, it is reasonable to suppose that during these years Aristotle carried his studies in natural science to a point far beyond that to which Plato or any other member of the school could have taken him. He seems also to have lectured, but perhaps only on rhetoric, and in opposition to Isocrates. He appears not to have studied under Isocrates, but his even, easy style, so well adapted to convey meaning with exactness and without redundance, and capable of rising to a lofty eloquence,[3] owes much to 'that

[1] E.g. *Met.* 990 ^{b}16. [2] *E.N.* 1096 ^{a}11–17. Cf. *Pol.* 1265 ^{a}10–12.
[3] E.g. in *De Cælo*, I., II.; *P.A.* I.; *Met.* Λ.; *E.N.* X.; *Pol.* VII., VIII.

old man eloquent ' whose influence on Greek and Latin style was so great. There is no writer (except Homer) whom he quotes so often in the *Rhetoric*. But he shared Plato's contempt for Isocrates' poverty of thought, and for his elevation of oratorical success over the pursuit of truth ; and in his youthful days this led him to criticise the orator in a way which was warmly resented by the Isocratean school. To this period probably belong several of his lost writings, in which he expressed in a more or less popular way not very original philosophical tenets. Further, in this period some of his extant works seem to have been begun.

When Plato was succeeded, in 348–7 B.C., by Speusippus, who represented the tendencies of Platonism with which Aristotle was most dissatisfied—in particular its tendency to 'turn philosophy into mathematics,' [1]—he doubtless felt a reluctance to continue in the school, nor was he, apparently, conscious of any vocation to start a school of his own. It is possible, too, that the outburst of anti-Macedonian feeling at Athens due to the fall of Olynthus and the destruction of the Greek confederacy made Athens an uncomfortable residence for an alien with Macedonian connexions ; but this reason can hardly have affected Xenocrates, the fellow-Academic who accompanied him in his migration from Athens. Whatever were his reasons, he accepted an invitation from a former fellow-student in the Academy, Hermias, who had risen from being a slave to be the ruler of Atarneus and Assos in Mysia, and there gathered round him a small Platonic circle. In this circle Aristotle spent some three years. He married Pythias, the niece and adopted daughter of Hermias, who bore him a daughter of the same name and seems to have died during his later stay in Athens. After her death he entered into a permanent and affectionate though not fully legalised union with a native of Stagira, Herpyllis, and had by her a son, Nicomachus, from whom the *Nicomachean Ethics* received their name.

At the end of these three years, Aristotle moved to Mitylene, in the neighbouring island of Lesbos. We do not know what took him there, but it seems likely that Theophrastus, a native of the island and already known to him as a fellow-Academic, may have found him a suitable residence. To his stay at Assos, and even more to his stay at Mitylene, belong many of his enquiries in the region of biology ; his works refer with remarkable frequency to facts of natural history observed

[1] *Met.* 992 a32.

in the vicinity, and more particularly in the island lagoon of Pyrrha.[1]

A reference by Isocrates,[2] about this time, to upstart philosophers who had established themselves in the Lyceum and treated him with insufficient respect has been thought to refer to Aristotle along with others; if so, he must at this period have paid a visit to Athens of which the ancient biographers know nothing. But the conjecture seems to be unfounded. In 343–2 Philip of Macedon, who had probably known Aristotle as a boy of about his own age, and had certainly heard of him from Hermias, invited him to undertake the education of Alexander, then thirteen years old. Aristotle, willing to renew old connexions with the Macedonian court, and attaching, as we can see from the *Politics*, great importance to the training of future rulers, accepted the invitation. The position gave him influence at court, and enabled him to intercede successfully on behalf of Stagira, of Athens, and of Eresus, the native town of Theophrastus, who went with him to Pella. Little or nothing is known of the education imparted by him to his distinguished pupil. The main subject of his teaching would probably be Homer and the dramatists, the staple of Greek education; Aristotle is said to have revised the text of the *Iliad* for his pupil. But Alexander was old enough to profit by more advanced instruction. In particular it is certain that Aristotle must have discussed with him the duties of rulers and the art of government. He composed for him a work on *Monarchy*, and one on *Colonies*, both subjects of special interest to one who was to be the greatest of Greek kings and of Greek colonisers. We may suppose that it was during his stay with Alexander—first at Pella and later at the royal castle of Mieza in its neighbourhood—that Aristotle's attention was specially drawn to political subjects, and that he formed the idea of his great collection of *Constitutions*. Alexander's genius led him to a life of action, not of study—to the subjugation of Asia, against which Aristotle had warned Philip, and to the attempt, inconsistent with Aristotle's belief in the unquestionable superiority of the Greek over the barbarian, to fuse Greek with Oriental

[1] Other places mentioned are Antandria, Arginusæ, Lectum, Pordoselene, Proconnesus, Scamander, Sigeum, Xanthus, the Hellespont, the Propontis. Cf. Thompson, trans. of *Hist. An.*, p. VII.; *Aristotle as a Biologist*, 12.

[2] 12, 18 ff.

civilisation. Relations between the two men seem never to have been entirely broken off, but there is no sign of real intimacy between them after Alexander's pupilage ended with his appointment as regent for his father in 340. Aristotle then probably settled at Stagira. It was no doubt during his stay with Alexander that he made the most permanent of his Macedonian friendships, his friendship with Antipater, soon to be appointed regent by Alexander during his absence in Asia, and thus to become the most important man in Greece. So close was the relation between them that when Aristotle came to die he made Antipater his chief executor.

In 335–4, soon after the death of Philip, Aristotle returned to Athens; and now begins the most fruitful period of his life. Outside the city to the north-east, probably between Mount Lycabettus and the Ilissus, lay a grove sacred to Apollo Lyceius and the Muses, in former days a favourite haunt of Socrates.[1] Here Aristotle rented some buildings[2]—as an alien he could not buy them—and founded his school. Here, every morning, he walked up and down[3] with his pupils in the *loggie* or among the trees, and discussed the more abstruse questions of philosophy; and in the afternoon or evening expounded less difficult matters to a larger audience. An old tradition distinguishes thus between the acroamatic or advanced discourses and the exoteric or popular. The distinction is no doubt sound enough, but it does not point, as has sometimes been thought, to anything mystical in the acroamatic discourses, or to the practice of an economy of truth towards the public. The more abstract subjects—logic, physics, and metaphysics—required a more intensive study and interested a smaller number, while subjects such as rhetoric, sophistic, or politics answered to a wider demand and could be expounded in a more popular way.[4]

Here also Aristotle collected probably some hundreds of manuscripts, the first of all great libraries and the model for those of Alexandria and of Pergamon; a number of maps; and

[1] Pl. *Euthyph.* 2 a; *Lysis*, 203 a; *Euthyd.* 271 a.

[2] In Theophrastus' will, Diog. Laert. V. 51, we read of *τὸ μουσεῖον* and *τὸ ἱερόν* (presumably the shrines of the Muses and of Apollo), and of a large and a small *στόα* or *loggia*.

[3] Hence the name Peripatetics.

[4] In *J. of P.* XXXV. 191–203, Prof. Henry Jackson reconstructed from Aristotle's works some interesting features of his lecture-room and his lectures.

a museum of objects to illustrate his lectures, especially those on natural history. Alexander is said to have given him 800 talents to enable him to form this collection and to have laid all the hunters, fowlers, and fishermen of the Macedonian empire under injunctions to report to Aristotle any matters of scientific interest that they observed. The sum is no doubt exaggerated, and Aristotle's knowledge of the more distant parts of the empire is not such as might have been expected from these orders; but the story probably has some foundation in fact. We hear of a constitution imposed by Aristotle on the school, whereby, for example, members took it in turn to 'rule' for ten days at a time; which may have meant, among other things, that one man during this period took the part of leader by maintaining theses against all comers, in the manner which became common in the mediaeval universities.[1] We hear of common meals, and of a symposium once a month for which Aristotle composed the rules. But of the work of the school, of the division of labour within it, we know very little. The composition of the lectures of which Aristotle's extant works are the notes probably belongs in the main to the twelve or thirteen years of his headship of the Lyceum, and the thought and research implied, even if we suppose that some of the spade-work was done for him by pupils, implies an energy of mind which is perhaps unparalleled. During this time Aristotle fixed the main outlines of the classification of the sciences in the form which they still retain, and carried most of them to a further point than they had hitherto reached; in some of them, such as logic,[2] he may fairly claim to have had no predecessor, and for centuries no worthy successor. And at the same time the school, by its interest in practical subjects like ethics and politics, was exercising an influence on ordinary life comparable to that of Socrates or Plato and far greater than that exercised by the cloistered students of the contemporary Academy.

On the death of Alexander in 323, Athens once more became the centre of an outbreak of anti-Macedonian feeling, and Aristotle's Macedonian connexions made him an object of suspicion. It is possible that the enmity of the Platonic and Isocratean schools conspired with political feeling against him. At all events, an absurd charge of impiety, based on a hymn and an epitaph which he had written on Hermias, was brought

[1] Blakesley, *Life of Arist.* 63.
[2] *Soph. El.* 183 ^{b}34–184 ^{b}3.

against him. Determined not to let the Athenians 'sin twice against philosophy,'[1] he left the school in Theophrastus' hands, and withdrew to Chalcis, a stronghold of Macedonian influence. Here in 322 he died of a disease to which he had long been subject. Diogenes has preserved for us his will, in which he makes careful provision for his relations, secures his slaves against being sold, and puts into practice one of the recommendations of the *Politics* by arranging for the emancipation of several of them. We are apt sometimes to think of Aristotle as simply an intellect incarnate; but his will affords the clearest evidence of a grateful and affectionate nature.

Little is known of his appearance or his manner of life.[2] A credible tradition describes him as bald, thin-legged, with small eyes and a lisp in his speech, and as noticeably well-dressed. The malevolence of enemies represented him as living a life of effeminacy and self-indulgence; what we may fairly believe, in view of his expressed opinions, is that he was not ascetic in his habits. We are told further that he had a mocking disposition which showed itself in his expression; and several sayings which indicate a ready wit are quoted by Diogenes Laertius.

The Works of Aristotle

Aristotle's literary work may be divided into three main sections, the first consisting of works of a more or less popular order which were published by himself, the second of memoranda and collections of material for scientific treatises, and the third of the scientific works themselves. Apart from the *Athenaion Politeia*, the whole existing Corpus of his works, so far as it is authentic, belongs to the third class. Of the others our knowledge rests on the fragments preserved in ancient authors, and on three lists which have come down from antiquity. Of these the oldest is that of Diogenes Laertius (early third century A.D.).[3] His list begins with nineteen works which appear to

[1] Ps.-Ammonius, *Aristotelis Vita*.

[2] But F. Studniczka in *Ein Bildnis des Arist.* (Leipzig, 1908) has made out a good case for treating a group of extant statues as representing Aristotle.

[3] It cannot well be based on the list drawn up by Andronicus (early first century B.C.), since it omits many of the extant works, which correspond to Andronicus' canon; nor can it be meant to supplement

have been popular in their character, and of which the greater number were, in imitation of Plato, written in dialogue. The dialogues appear to have been less dramatic than at any rate the earlier dialogues of Plato ; but they were doubtless written with more care for literary effect than the extant works, and it must be to them that Cicero's praise of Aristotle's *flumen orationis aureum* [1] and Quintilian's of his *eloquendi suavitas* [2] refer. It is natural to suppose that his use of this form of composition belongs to his early life, when he was still a member of Plato's school ; and this is confirmed by the Platonic titles of some of the dialogues—*Politicus, Sophistes, Menexenus, Symposium*—and by the generally Platonic character of the contents. Among the earliest of the dialogues, probably, was that *On Rhetoric,* also known as the *Grylus.* Grylus was the son of Xenophon who was killed at the battle of Mantinea (362–1), and the dialogue probably dates from a time not much later. Another early dialogue was the *Eudemus, or On the Soul,* which takes its name from Aristotle's friend Eudemus of Cyprus, who died in 354–3. It was modelled closely on the *Phaedo,* and accepted implicitly the Platonic doctrines of pre-existence, transmigration, and recollection. To the same period probably belongs the *Protrepticus,*[3] an exhortation to the philosophic life addressed to the Cyprian prince Themison ; it was very popular in antiquity, and furnished Iamblichus with materials for his own *Protrepticus,* and Cicero with a model for his *Hortensius.* A later date should be assigned to the dialogue *On Philosophy,* in which Aristotle gave an account of the progress of mankind, largely Platonic in character but differing from Plato's in asserting the eternal pre-existence of the world, and proceeded to oppose definitely the doctrine of Ideas and of Ideal Numbers. The dialogue belongs to about the same date as the earliest parts of the *Metaphysics.* To a still later period, i.e. to his stay at the Macedonian court (or later), belong the *Alexander, or about Colonists* (? *Colonies*) and the work *On Monarchy.* Other dialogues of which little but the names are known are those *On Justice, On the Poets, On Wealth,*

that list, since it contains several of the extant works. It probably is, or is based on, a list made by Hermippus *c.* 200 B.C., when many of the works edited later by Andronicus had been forgotten.

[1] *Acad.* 2. 38. 119.

[2] 10. 1. 83.

[3] It has been much discussed whether this was a dialogue or a continuous address. The balance of argument is in favour of the latter view.

On Prayer, *On Good Birth*, *On Education*, *On Pleasure*, the *Nerinthus*, and the *Eroticus*.

With these works may be named his poems, of which three specimens have been preserved, and his letters. Of the fragments of the latter which we possess, those to Antipater have the ring of authenticity.

Little need be said of the lost memoranda and collections of material[1] nor of the lost scientific works. Over 200 titles of works believed at the time to be Aristotle's have been preserved in the three ancient catalogues. But the titles often repeat one another, and there is every reason to suppose that the lists are lists of separate manuscripts rather than of separate books. Many entries in Diogenes Laertius' list with titles at first sight unfamiliar seem nevertheless to refer to parts of extant works.[2] In this connexion it must be noted that the longer existing works are not unitary wholes but collections of essays on connected themes, and that the separate essays are the original units, which were connected together sometimes by Aristotle and sometimes (as in the case of the *Metaphysics*) by his editors.[3] Of some of the lost books considerable fragments are quoted by ancient authors, and it is possible in such cases to form a fairly accurate idea of their contents. At least one genuine work has reached us, it would seem, in a fairly complete abbreviated form.[4] Much scholarship has been expended, and by no means without result, in tracing probable connexions between the lost and the extant works. But the latter alone are enough to give us a fairly comprehensive idea of the variety of subjects Aristotle covered, though not of his immense literary activity.

Of the extant works we may first consider the group of logical treatises known at least since the sixth century as the *Organon* or instrument of thought. The first of these, in the usual order, is the *Categories*. The authenticity of this book

[1] These collections of material were sometimes produced by Aristotle in collaboration; a Delphic inscription shows that a list of victors in the Pythian games was the joint work of Aristotle and his nephew Callisthenes.

[2] E.g. Nos. 31, 32, 53, 57–60 (Rose, *Aristotelis Fragmenta*, 1886) probably refer to parts of the *Topics*, and No. 36 to *Met.* Δ.

[3] This is well brought out by Jaeger in *Entstehungsgeschichte der Metaphysik des Aristoteles* (148–163), which is the best discussion of the mode of production of Aristotle's works.

[4] Partsch has made out a good case for the Aristotelian origin of the book *On the Rising of the Nile* (*Des Aristoteles Buch 'Über das Steigen des Nil,'* Leipzig, 1909).

has been denied. There are no clear references to it in admittedly genuine works of Aristotle. But it was accepted without question in antiquity,[1] and commented on as a genuine work by a series of commentators beginning in the third century A.D. with Porphyry; indeed the evidence for its acceptance goes back to Andronicus (early first century B.C.).[2] The arguments against it from the point of view of Aristotelian doctrine[3] are not conclusive, and its grammar[4] and style are thoroughly Aristotelian. The last six chapters, dealing with the so called Post-predicaments, stand on a somewhat different footing. They were suspected by Andronicus, and are foreign to the purpose of the book. But they may well be the work of Aristotle.

The *De Interpretatione* was suspected by Andronicus, on the ground, apparently,[5] of a reference[6] to the *De Anima* to which nothing in that work corresponds. There are, however, many such references in undoubtedly genuine works of Aristotle, and more than one way of explaining them. There is strong external evidence for its authenticity; Theophrastus and Eudemus both wrote books which seem to presuppose it, and Ammonius tells us that Andronicus was the only critic who cast doubt on it.[7] Finally, its style and grammar seem to be genuinely Aristotelian. All that can really be said against it is that much of it is somewhat elementary; but Aristotle doubtless gave elementary as well as advanced lectures.[8]

[1] With the exception of an unnamed critic apparently referred to in *Schol.* 33 a28 ff.

[2] This seems to be implied by his rejection of the Post-predicaments, *Schol.* 81 a27 ff. Ammonius (*Schol.* 28 a40) says that Theophrastus and Eudemus wrote *Categories* in imitation of Aristotle's work.

[3] The most recent presentation of them is by E. Dupréel in *Arch. f. Gesch. d. Phil.* XXII. 230–251. He rightly calls attention to the cut-and-dried, dogmatic style of the book, which is very different from Aristotle's usual method of advance by free discussion of difficulties. I should be inclined to attribute this characteristic (which is found also in the *De Interpretatione* and in large parts of the *Prior Analytics*) to the fact that logic is in Aristotle's view a study preliminary to science and philosophy. Books addressed to less advanced students are naturally more dogmatic in their tone.

[4] Detailed evidence on the grammar of Aristotle and of the pseudo-Aristotelian works may be seen in Eucken, *De Aristotelis Dicendi Ratione* and *Ueber den Sprachgebrauch des Aristoteles* (on the use of particles and prepositions respectively).

[5] *Schol.* 97 a20. [6] *De Int.* 16 a8. [7] *Schol.* 97 a13.

[8] The authenticity of the book is elaborately and successfully defended by H. Maier in *Arch. f. Gesch. d. Phil.* XIII. 23–71. He suggests that the reference in 16 a8 should be transferred to 16 a13 and relates to *De An.* III. 6.

The *Prior* and the *Posterior Analytics* are undoubtedly genuine, as are also the *Topics* and the *Sophistic Elenchi*. Aristotle quotes the latter by the name of *Topics*, and its concluding passage is an epilogue to the *Topics* as a whole.

The physical treatises begin with a group of undoubtedly genuine works, the *Physics*, the *De Caelo*, the *De Generatione et Corruptione*, and the *Meteorologica*. The *Physics* was originally composed as two distinct treatises, comprising books I.–IV. (or I.–V.) and books V., VI., VIII. (or VI.–VIII.) respectively, for Aristotle usually refers to the first group as the *Physics* or the books *On Nature*, and to the second as the books *On Movement*, and there are many traces of this distinction among the later Peripatetics. But he also uses the term *Physics* to include not only the later books but others of the physical treatises. Book VII was passed over by Eudemus in his revision of the work, and is rather of the nature of preliminary notes.[1] Of the *Meteorologica*, Book IV, though possibly genuine, does not belong to the original scheme of the work and may have taken the place of a missing book.

The next treatise in the Corpus, the *De Mundo*, has no claim to be regarded as Aristotle's. Its attribution to him may be due to its being addressed to an Alexander who is called 'the noblest of rulers.' But this is now supposed to have been Tiberius Claudius Alexander, nephew of Philo Judæus and in 67 A.D. Prefect of Egypt. Its date is probably not long before nor after 100 A.D.; its philosophy is mostly derived from Poseidonius.[2]

Next comes a series of authentic works on psychology, the *De Anima* and the works known collectively as the *Parva Naturalia*, viz. *De Sensu et Sensibili, De Memoria et Reminiscentia, De Somno, De Somniis, De Divinatione per Somnum, De Longitudine et Brevitate Vitae, De Vita et Morte, De Respiratione*. The first two chapters of the *De Vita* are headed by the editors *De Juventute et Senectute*, but, though Aristotle elsewhere promises a work on this subject, it is uncertain whether he ever wrote it; certainly these two chapters do not deal with the subject.

The *De Spiritu*, which closes this series of psychological works, is not by Aristotle, for it recognises the distinction of veins and arteries, which was unknown to him. Its language, however, is not far removed from that of Aristotle, and it

[1] Perhaps taken down by a pupil, cf. Eucken, *De Ar. Dic. Rat.* 11.
[2] 138–45 B.C.

may be the work of Theophrastus or of Strato, about 300 B.C.

The psychological series is succeeded by a group of works on natural history. Of the first of the group, the *Historia Animalium*, Book X. and probably also Books VII., VIII. 21–30, and IX. are spurious, and date in all likelihood from the third century B.C. The *Historia Animalium* is a collection of facts; it is succeeded by works in which Aristotle states his theories based on them. The first of these is the *De Partibus Animalium*, of which the first book is a general introduction to biology. The *De Motu Animalium* has by many scholars been regarded as spurious, largely because of a supposed reference in it to the *De Spiritu*,[1] but recent opinion is in its favour; its style is Aristotelian,[2] and its contents not unworthy of the master. The *De Incessu Animalium* and the *De Generatione Animalium* are of undoubted authenticity; the last book of the latter is an epilogue to the *De Partibus* as well as to the *De Generatione*.

The biological works are succeeded by a number of spurious treatises. The *De Coloribus* has been ascribed to Theophrastus and to Strato, the *De Audibilibus* with more probability to Strato. The *Physiognomonica* (? third century B.C.) is a combination of two treatises, both perhaps Peripatetic. The *De Plantis* is, of all the works in the Corpus, that which has had the most peculiar history. Aristotle seems, from references by himself, to have written a work on plants, but it had perished by the time of Alexander of Aphrodisias, and the extant work is translated from a Latin translation of an Arabic translation of a work whose probable author was Nicolaus of Damascus, a Peripatetic of the time of Augustus. The amusing work known as the *De Mirabilibus Auscultationibus* consists (1) of excerpts from biological works of Theophrastus and others; (2) of historical extracts, mostly from Timaeus of Tauromenium (*c.* 350–260 B.C.) derived through Posidonius; these two sections were probably put together not earlier than the time of Hadrian; (3) of an appendix (*cc.* 152–178) which may be as late as the sixth century. The *Mechanica* seem to belong to the early Peripatetic school—perhaps to Strato or one of his pupils. They discuss the lever, the pulley, and the balance, and expound with considerable success some of the main principles of statics—the law of virtual velocities, the parallelogram of forces, and the law of inertia.

[1] 703 a10. Mr. Farquharson in his translation has suggested other works to which the reference may point.

[2] Eucken detected nothing unaristotelian in its grammar.

The *Problems*, though resting in the main on Aristotelian presuppositions, show considerable traces of a materialism which was characteristic of the later Peripatetic school. The work seems to have been put together, perhaps not before the fifth or six century, out of various collections of problems—mathematical, optical, musical, physiological and medical—excerpted in the main from the Theophrastean Corpus, but largely also from the writings of the Hippocratic school, and in a few cases from extant works of Aristotle. It affords interesting evidence of the variety of the studies to which Aristotle stimulated his pupils. The *Musical Problems*, which are on the whole the most interesting, consist of two collections probably dating from about 100 A.D.

The *De Lineis Insecabilibus* is directed primarily against Xenocrates, and presumably is at all events not much later than his time. Its doctrine resembles that of Theophrastus to whom Simplicius ascribed it ; Strato has also been suggested as the author. The *Ventorum Situs* is an extract from a treatise *De Signis* usually ascribed to Theophrastus and dating from about his time. The *De Xenophane, Zenone, Gorgia* (more properly *De Melisso, Xenophane, Gorgia*) is probably based on authentic treatises of Aristotle but actually the work of an eclectic of the first century A.D.

The earliest reference that we have to the *Metaphysics* by that name occurs in Nicolaus of Damascus. As the name occurs constantly from him onwards, it may safely be supposed that it was due to the editorial work of his older contemporary Andronicus, and that it meant merely the treatises which were placed after the physical works in Andronicus' edition. Hesychius' catalogue of Aristotle's works mentions a *Metaphysics* in 10 books. This was probably our *Metaphysics* with the omission of (1) book *α*, the name of which shows that it was inserted in the *Metaphysics* only when the original numbering was complete. This book is an introduction not to metaphysics but to physics or to theoretical philosophy in general. It is Aristotelian in character, but an ancient tradition ascribed it to Pasicles, nephew of Eudemus,[1] and this ascription is more likely to be correct than one to a better-known person would have been. The 10-book *Metaphysics* doubtless excluded (2) book *Δ*, which appears separately in Hesychius' list as the book *On the Various Meanings of Words*, and (3) book *K*, of which the first part is merely a shorter version of books *BΓE* and the

[1] *Schol.* 589 ᵃ41.

latter part a series of extracts from *Physics* II., III., and V. The grammar of *K* is in some respects unaristotelian,[1] and it represents pretty certainly the notes of a pupil.[2] Finally, the 10-book *Metaphysics* probably excluded (4) book *Λ*, which does not refer to any of the other books and forms a separate treatise on the First Cause (with a preliminary account of physical substance).

The earliest parts of the *Metaphysics* are probably *A*, *Δ*, *K* (first part), *Λ*, *N*. *K* was later replaced by *B Γ E*; *M* (a later, and very different, version of *N*) was prefixed to *N*; and *A B Γ E Z H Θ I M N* were worked up into a fairly well-knit whole, linked together by frequent cross-references which may well go back to Aristotle himself.

Next follows a group of ethical treatises, the *Nicomachean Ethics*, the *Magna Moralia*, and the *Eudemian Ethics*. Many scholars have supposed the *Eudemian Ethics* to be a later work, written by Aristotle's pupil Eudemus; but the most natural explanation of the titles *Nicomachean* and *Eudemian Ethics* is that these works are editions by Nicomachus and Eudemus respectively of two courses on ethics by Aristotle.[3] The most detailed investigator of Aristotle's grammar [4] came to the conclusion that the grammar of the *Eudemian Ethics* was that of Aristotle. It has recently, moreover, been pointed out that this work stands in the direct line of development from the *Protrepticus* to the *Nicomachean Ethics*.[5] The probability is that it is a fairly early work, dating, like the earliest parts of the *Metaphysics*, from Aristotle's stay at Assos between 348 and 345. A problem which has exercised the curiosity and the ingenuity of many scholars is presented by the fact that at the end of the third book of the *Eudemian Ethics* (answering to the fourth of the *Nicomachean*) the MSS. state that the next three books are identical with the next three of the *Nicomachean*, and pass forthwith to what they call the seventh book. Do these three books belong to the *Nicomachean* or to the *Eudemian Ethics*, or partly to the one, partly to the other; did two treatises ever exist on the subjects dealt with in these books, or is the version

[1] Eucken, *De Ar. Dic. Rat.* 10, 11.
[2] Alexander comments only on the first part.
[3] Alexander tells us (*Schol.* 760 ᵇ20) that the *Metaphysics* similarly was edited by Eudemus. Cf. Asclepius (*Schol.* 519 ᵇ38).
[4] Eucken.
[5] Jaeger, *Arist.* 237–270; cf. Case in *Enc. Brit.* II. 512–515.

we have the only one that ever existed? Almost every possible variety of answer has been given to both these questions, and several of them have been supported by attractive arguments; opinion is still divided on the subject. Most of the parallels or cross-references between these books and the other books of the two treatises may be met by others equally apposite. The following points, however, have not received the attention they deserve :—(1) The oldest catalogue of Aristotle's works (that of Diogenes Laertius) refers only to one *Ethics*, to which it assigns five books; this can only be the *Eudemian Ethics without* the doubtful books. The next oldest catalogue contains only one *Ethics*, to which it assigns ten books; this can only be the *Nicomachean Ethics with* the doubtful books. If, as is commonly supposed, both these lists rest on the authority of Hermippus, we find the doubtful books assigned as early as 200 B.C. to the *Nicomachean Ethics* and not to the *Eudemian*. (2) Certain grammatical peculiarities have been noticed in the *Eudemian Ethics* which do not appear in the disputed books.[1]

These books, then, probably belong to the *Nicomachean Ethics*. The *Eudemian Ethics* probably had at one time a corresponding section of its own. For (1) there are references in the *Eudemian Ethics* which seem to presuppose a rather different handling of the matter of the central three books, and (2) the *Magna Moralia*, which follows very closely the *Eudemian Ethics*, introduces in the corresponding section matter which is not found in the three books as we have them. The *Magna Moralia* apparently dates from the late third or from the second century B.C.; it contains traces of Theophrastean doctrine and of Stoic terminology. The *De Virtutibus et Vitiis* is an attempt, dating probably from the first century before or the first century after Christ, to reconcile Peripatetic with Platonic morals.

The *Politics* is an undoubted work of Aristotle. There has been much discussion of the 'proper' order of its books. Really, however, it consists of a number of originally independent essays, which are not completely worked up into a whole.[2]

Of the *Oeconomica*, the first book is a treatise based on the first book of the *Politics* and on Xenophon's *Oeconomicus*, and probably written by Theophrastus or by some other Peripatetic

[1] Cf. Eucken, *De Ar. Dic. Rat.* 9, 34; *Sprachgeb. des Ar.* 10. These peculiarities may be due to Eudemus.

[2] Cf. p. 235 f.

of the first or the second generation. The second book is a worthless compilation of stories dating probably from 260–200 B.C. The third, which exists only in a Latin translation, may be identical with the *Laws of Husband and Wife* mentioned in Hesychius' catalogue, but is not by Aristotle. It is thought to be the work partly of a Peripatetic living between 250 and 30 B.C., and partly of a Stoic living between 100 and 400 A.D.

The *Rhetoric* is, as regards its first two books, undoubtedly the work of Aristotle. The third book was at one time suspected, but its authenticity has been sufficiently vindicated.[1] The *Rhetorica ad Alexandrum* was by some scholars attributed to Aristotle's earlier contemporary Anaximenes of Lampsacus, but contains elements of Aristotelian doctrine and probably dates from the beginning of the third century B.C.[2] The Corpus closes with the genuine but fragmentary *Poetics*. Of the lost works of Aristotle, none is more to be regretted than his description of the *Constitutions* of 158 Greek states. A happy fortune brought to light in Egypt, in 1890, a papyrus containing the first of these, the *Constitution of Athens*.

The whole, or almost the whole, of the extant works of Aristotle are commonly thought to belong to the period of his headship of the Lyceum, and the question naturally arises, what is the relation of the written works to his oral teaching? It has often been suggested that the rough and unfinished condition of many of his works, the repetitions and digressions, are due to their being not works prepared for publication but either Aristotle's own lecture notes or notes taken down by pupils. The latter hypothesis is ruled out by various considerations. It is hard to suppose that the notes of pupils would have produced so coherent and intelligible a result as the works in the main present, or that the notes of different pupils (for we can hardly suppose one to be responsible for the whole Corpus) would have shown such a uniformity of style.[3] Nor is it possible to regard the works as nothing but Aristotle's

[1] Diels has shown (*Abh. d. preuss. Akad.* 1886) that Book III. was originally a separate treatise, probably the περὶ λέξεως which figures in Diogenes' list.

[2] Mr. Case argues in *Enc. Brit.* II. 515 f. that it is a genuine work, earlier than the *Rhetoric*. He succeeds in showing that if earlier than the *Rhetoric* it must be by Aristotle, and therefore that it cannot be by Anaximenes. But its language seems in some respects to belong to a date *later* than that of Aristotle.

[3] *Phys.* VII., *Met.* α K may not improbably be pupils' notes of Aristotle's lectures.

own rough notes for lectures. A portion of one book definitely presents such a character,[1] and it is likely that others, in which terseness is pushed to the point of obscurity,[2] have a similar origin.[3] But most of the works are not like this. They show a fullness of expression and an attention to literary form which is incompatible with their being mere rough memoranda for lectures. Two passages have been cited as evidence that Aristotle is addressing hearers and not readers, but neither is convincing.[4] There can be no doubt, however, of the close connection of most of the written works with the teaching in the Lyceum.[5] Aristotle *may* have written out his lectures complete before delivering them, and the written works may be his lectures in this sense; but it seems likely that he lectured more freely than this, and that the books as we have them were written down subsequently by him as memoranda to show to those who had missed the lectures, and by way of having a more accurate record of his views than the memory or the notes of his students could provide. The repetitions and the slight divergences of view which have been observed in his works are to be explained by the fact that he did not deal with a subject once and for all, but returned to it again and again. Unskilful editorship has often preserved, through unwillingness to sacrifice anything that the master had written, double or triple versions of his thought on the same question.

The probable connection of the extant works with Aristotle's second residence at Athens (*c.* 335–323) is on the whole confirmed by such notes of time as can be detected in the works themselves. The casual allusions—to the road from Athens to Thebes, the sail to Aegina, the festivals of the Dionysia and

[1] *Met. Λ.* 1–5, which contains only one reference to another work, and twice (1069 ^{b}35, 1070 ^{a}4) has the phrase *μετὰ ταῦτα ὅτι*, 'the next point to be made is that.' Cf. *An. Pr.* 24 ^{a}10–15.

[2] E.g. *De An.* III.

[3] Prof. H. Jackson has well brought out in *J. of P.* XXXV. 196–200 the appearance in Aristotle's works of many of the habitual methods of lecturers.

[4] (*a*) *Soph. El.* 184 ^{b}3–8. The distinction drawn in *πάντων ὑμῶν ἢ τῶν ἠκροαμένων* seems pointless, and I am inclined to regard *ἢ τῶν ἠκροαμένων* as a (correct) gloss. (*b*) *E. N.* 1104 ^{b}18 *ὡς καὶ πρῴην εἴπομεν*. But *πρῴην* is as likely to mean 'a little way back' as 'the day before yesterday.'

The *Ethics* contains, of all the works, the most frequent references to hearers (1095 ^{a}2 ff., 12, ^{b}4, 1147 ^{b}9, 1179 ^{b}25).

[5] The *Physics* is headed in the MSS. 'Course on Physics,' and the *Politics* was at one time headed 'Course on Politics.'

the Thargelia, the actor Theodorus' management of his voice [1]—presuppose an Athenian audience. The observation on the position of the constellation Corona agrees with the latitude of Athens much better than with that of Pella.[2] The second period of Aristotle's residence at Athens rather than the first is suggested by casual references to the Lyceum itself.[3] References to historical events point in the same direction. In the *Meteorologica* Aristotle refers to the archonship of Nicomachus (341),[4] and seems to describe himself as over fifty years old;[5] this points to a date later than 334. The *Politics* refer to the murder of Philip (336);[6] the *Rhetoric* refers to events in 338–336;[7] the *Constitution of Athens* cannot be earlier than 329–8.[8] The astronomical theories of Callippus referred to in *Metaphysics Λ* can hardly be dated before 330–325. On the other hand, in *Meteor.* 371 ^{a}31, the burning of the temple of Ephesus (365), and in *Pol.* 1312 ^{b}10, the expulsion of Dionysius. II from Syracuse by Dion (357–6), are referred to as having happened *νῦν*; from which it follows that these works were probably *begun* in Aristotle's first residence at Athens.

If we ask in what order it is psychologically most likely that Aristotle's works were written, the answer must be that presumably his writings would reflect a progressive withdrawal from Plato's influence. Taking this as our leading principle, and using such minor indications of date as we have at our disposal, we may say that he began by writing dialogues on the Platonic model, but that in the latest of these his protest against Plato's 'separation' of the Forms from sensible things began to be felt. The dialogues probably belong in the main to the time of his membership of the Academy. To the period of his stay in the Troad, in Lesbos, and in Macedonia belongs the earliest form of those extant works which are largely Platonic in character—the *Organon*,[9] the *Physics*, the

[1] *Phys.* 202 ^{b}13; *Met. Δ.* 1015 ^{a}25, 1025 ^{a}25, 1023 ^{b}10; *Rhet.* 1404 ^{b}22. Cf. *Pol.* 1336 ^{b}28.

[2] *Meteor.* 362 ^{b}9. There are, however, reasons for doubting the genuineness of this passage.

[3] *Cat.* 2 ^{a}1; *Phys.* 219 ^{b}21; *Rhet.* 1385 ^{a}28.

[4] 345 ^{a}1.

[5] 372 ^{a}28.

[6] 1311 ^{b}1.

[7] 1397 ^{b}31, 1399 ^{b}12.

[8] See ch. 54, 7.

[9] The *Topics* may have been composed in the order—II.–VII. 2, VII. 3–5, I., VIII. So H. Maier in *Syllogistik des A.* II. 2, 78, n. 3. The main part of the work, II.–VII. 2, moves for the most part within the Platonic circle of ideas.

Four references to the *Analytics* occur in the *Topics* and the

De Caelo, the *De Generatione et Corruptione*, the third book of the *De Anima*, the *Eudemian Ethics*, the oldest parts of the *Metaphysics* and of the *Politics*. To his second Athenian period belongs the whole series of his works of research—the *Meteorologica*, the works in psychology and biology, the collection of *Constitutions*, and the other great historical researches which we know little more than by name. To this period also belongs the completion and the working-up of the extant works begun in the middle period.[1] The general movement, we may say, was from otherworldliness towards an intense interest in the concrete facts both of nature and of history, and a conviction that the 'form' and meaning of the world is to be found not apart from but embedded in its 'matter' and actual structure.

Sophistic Elenchi. But four references the other way also occur, and the *Analytics* are obviously more mature than the *Topics*.

H. Maier argues in *Arch. f. Gesch. d. Phil.* XIII. 23–72 for the view that the *De Interpretatione* is the latest of all the extant works, and was left unfinished by Aristotle. But Mr. Case has pointed out in *Enc. Brit.* II. 511 f. that the analysis of the judgment in the *De Int.* is more primitive than that in the *Prior Analytics*, and more akin to that in Pl. *Soph.* 261 e ff.

[1] Jaeger's brilliant argument for this order in his *Aristoteles* seems to me convincing.

CHAPTER II

LOGIC

THE sciences are divided by Aristotle [1] into the theoretical, the practical, and the productive; the immediate purpose of each kind is to know, but their ultimate purposes are respectively knowledge, conduct, and the making of useful or beautiful objects. Logic, if it entered into this classification, would have to be included among the theoretical sciences; but the only theoretical sciences are mathematics, physics, and theology or metaphysics,[2] and logic cannot be included under any of these. It is in fact, according to Aristotle, not a substantive science,[3] but a part of general culture which everyone should undergo before he studies any science, and which alone will enable him to know for what sorts of proposition he should demand proof and what sorts of proof he should demand for them.[4] A similar conception underlies the application of the word *Organon* or *instrument* (sc. of science) to logical doctrine [5] and ultimately[6] to the collection of Aristotle's logical works.

The name *logic* is unknown to Aristotle, and cannot be traced further back than the time of Cicero. Even then *logica* means not so much logic as dialectic, and Alexander is the first writer to use λογική in the sense of logic. Aristotle's own name for this branch of knowledge, or at least for the study of reasoning, is 'analytics.' Primarily this refers to the analysis of reasoning into the figures of syllogism,[7] but we may perhaps extend it to include the analysis of the syllogism into propositions and of the proposition into terms.

The logical treatises fall into three main parts:—(1) the *Prior Analytics*, in which Aristotle aims at laying bare the

[1] *Met.* 1025 b25. [2] *Ib.* 1026 a18.
[3] Though he speaks once of 'the analytic science' (*Rhet.* 1359 b10).
[4] *P.A.* 639 a4; *Met.* 1005 b3, 1006 a6; *E. N.* 1094 b23.
[5] By Alexander of Aphrodisias (200 A.D.).
[6] In the sixth century. [7] *An. Pr.* 47 a4; *An. Post.* 91 b13, etc.

structure which he regards as common to all reasoning—the syllogism—and at exhibiting its formal varieties, irrespective of the nature of the subject-matter dealt with. This may fairly be called a formal logic or logic of consistency. (2) The *Posterior Analytics*, in which he discusses the further characteristics which reasoning must have if it is to be not merely self-consistent but in the full sense scientific. This is emphatically a logic interested not in mere consistency but in truth. (3) The *Topics* and *Sophistic Elenchi*, in which he studies those modes of reasoning which are syllogistically correct but fail to satisfy one or more of the conditions of scientific thought. The *Categories* and the *De Interpretatione*, which roughly speaking study the term and the proposition respectively, may be regarded as preliminary.

Aristotle has, though he does not explicitly discuss the question, a clear idea of the difference between logic and other studies with which it has sometimes been identified or confused—grammar, psychology, metaphysics. It is for him a study not of words but of the thought of which words are signs; of thought not with reference to its natural history but with reference to its success or failure in attaining truth; of thought not as constituting but as apprehending the nature of things.

Terms

The *Categories* begins, as all logic perhaps must, by a consideration of linguistic facts; it distinguishes 'things said without combination' from 'things said in combination,'[1] i.e. words and phrases such as 'man,' 'runs,' 'in the Lyceum,' from propositions such as 'man runs.' 'Words uncombined' are said[2] to mean one or other of the following things:—

Substance (e.g. 'man').
Quantity (e.g. 'two cubits long').
Quality (e.g. 'white').
Relation (e.g. 'double').
Place (e.g. 'in the Lyceum').
Date (e.g. 'yesterday').
Position (e.g. 'sits').
State (e.g. 'is shod').
Action (e.g. 'cuts').
Passivity (e.g. 'is cut').

These categories—some or all of them—appear in almost

[1] 1 a16. [2] 1 b25.

every one of Aristotle's works, and the doctrine is everywhere treated as something already established. About the number of the categories he takes no pains to be consistent. Position and state reappear only once, in another presumably early work,[1] and once the other eight are quoted as forming a complete list.[2] It seems as if he had later come to the conclusion that position and state are not ultimate, unanalysable notions.

There has been much controversy as to the meaning of the doctrine, largely owing to the fact that we nowhere in Aristotle see it in the making. Trendelenburg held that the distinctions between the categories are derived from grammatical distinctions. It is easy to see that a study of the forms of language was one of Aristotle's main guides in the formulation of the doctrine; e.g. relations are distinguished from other things by the fact that the names for them govern a word in the genitive or in the dative case.[3] But he had no list of the parts of speech on which he could base a list of categories; the only parts of speech which he recognizes as such are the noun and the verb.[4] And the doctrine of the categories brings together things which grammar separates,[5] and separates things which grammar brings together.

Again, it has been urged[6] that the doctrine of the categories was developed within the Academy and merely taken over by Aristotle, but of this there is no real evidence. The categories seem to have little in common with either the 'greatest classes' of the *Sophistes*[7]—being, sameness, otherness, rest, movement—or with the 'common properties' of the *Theaetetus*[8]—likeness and unlikeness, being and not being, identity and difference, odd and even, unity and number. What Aristotle owes to Plato is rather the recognition of the abstract notions of substance, quality, quantity, relation, activity and passivity. The allusions to them occur quite incidentally in

[1] *Top.* 103 b23.

[2] *An. Post.* 83 b15. Cf. *Phys.* 225 b5–9, 226 a23–25.

[3] *Cat.* 6 b6–11, 8 a17–28. Thus science is a *πρός τι*, but the particular sciences are not, 11 a23–32; *στάσις* is a *πρός τι*, but *τὸ ἑστάναι* is not, 6 b11.

[4] *De Int.* 2, 3. *Poet.* 20, whose authenticity is much in question, adds the conjunction and the article.

[5] E.g. quantity and quality include certain nouns as well as adjectives, 4 b23, 9 a29.

[6] E.g. by A. Gercke in *Arch. f. d. Gesch. d. Phil.* IV. 424–441.

[7] 251 ff., esp. 254 d.

[8] 185.

Plato; he never connects them systematically. But his recognition of them as general aspects of reality must have considerably aided Aristotle's thought.

It is sometimes held that the essential object of the doctrine was to solve certain difficulties about predication which had troubled earlier thinkers, by distinguishing the various senses which the word 'is' can bear.[1] Aristotle uses the doctrine for this purpose, and in presumably later works (notably in the *Metaphysics*) the categories are often referred to as 'the various meanings of being.' But it would seem that in its earliest form the doctrine was a classification of the meanings of, i.e. of the *things* meant by, 'uncombined words,' in other words an inventory of the main aspects of reality, so far at least as language takes account of them.

Why are they called categories? The ordinary meaning of *κατηγορία* is 'predicate,' but the first category has for its primary members individual substances, which according to Aristotle's doctrine are never properly predicates but always subjects. It has sometimes, therefore, been thought that primary substances do not fit properly into the doctrine of the categories. But this is not the case. 'Socrates' is, indeed, on Aristotelian principles no proper predicate; but if we ask what Socrates is, the ultimate, i.e. the most general, answer is 'a substance,' just as, if we ask what red is, the ultimate answer is 'a quality.' The categories are a list of the widest predicates which are predicable essentially of the various nameable entities, i.e. which tell us what kinds of entity at bottom they are.

The primary category is substance, which is the substratum presupposed by all the others. Within substance Aristotle distinguishes[2] (1) primary substance, which is 'neither asserted of a subject nor present in a subject,' e.g. particular men or horses, and (2) secondary substances, i.e. the species and genera in which primary substances are included; these are 'asserted of a subject but not present in a subject.' 'Asserted of a subject' here refers to the relation of universal to particular, 'present in a subject' to that of an attribute to its possessor. All the categories other than substance are 'present in a subject'; some of the things in them, e.g. knowledge, are 'asserted of a subject' as well; others, such as a particular

[1] This view is ably expressed in O. Apelt's *Beiträge zur Geschichte der Griechischen Philosophie.*

[2] 2 a 11

piece of grammatical knowledge, are not.[1] Thus the distinction of primary and secondary (i.e. of individual and universal) might have been drawn in the other categories as well as in that of substance; but Aristotle does not explicitly draw it.

The primacy of individual substance is one of the most fixed points of Aristotle's thought—the point at which he most clearly diverges from Plato's doctrine. But while primary substance is for him the most real thing, secondary substance, and in particular the *infima species*, is the central point of his logic. For logic is a study of thought, and that which the individual contains over and above its specific nature is due to the particular matter in which it is embodied, and thus eludes thought. In so far as they can be known, the members of an *infima species* are identical, and it is only those properties of them which flow from their specific nature that can be grasped by science.

The remainder of the certainly genuine part of the *Categories*[2] is occupied with bringing out by comparison the characteristics of substance and of the chief of the other categories. The main characteristics of substance are that (1) it is not 'in a subject'; (2) it is predicated unambiguously (this is true only of secondary substance); (3) it is individual (this is true only of primary substance); (4) it has no contrary and no degrees; (5) it admits of contrary qualifications. The other categories are considered with respect to their possession or non-possession of these same characteristics.

We may now turn to the question, what Aristotle has to say of the act in which 'words uncombined' are held before the mind,[3] the *apprehensio simplex* of later logic. He explicitly

[1] 1 ^{a}29, 23. This explicit distinction between individual qualities, quantities, etc., and the general qualities, quantities, etc., of which they are instances occurs, I think, nowhere else in Aristotle. The general tendency both in Aristotle and in subsequent philosophy has been to draw no distinction between universal and individual except in the category of substance. Prof. Stout has, however (in *Proc. of the Brit. Acad.* Vol. X.) recently urged a precisely similar distinction. 'A character characterising a concrete thing or individual is as particular as the thing or individual which it characterises. Of two billiard balls, each has its own particular roundness separate and distinct from that of the other, just as the billiard balls themselves are distinct and separate.'

[2] Chs. 5–9. Chs. 10–15 are commonly regarded as spurious.

[3] φάσις, *De Int.* 16 ^{b}27, 17 ^{a}17; *Met.* 1051 ^{b}25. Sometimes, however, φάσις is used as equivalent to affirmation, and sometimes as covering

distinguishes it from judgment. It is a sort of contact with its object.[1] This comparison takes us into Aristotle's psychology of perception. He there distinguishes between (1) the apprehension of the sensible qualities peculiar to each sense—colour, sound, etc.; and (2) the apprehension of the 'common sensibles' such as size and shape, and of concomitants (as when the sight of an object suggests its tangible qualities). The first kind of apprehension is infallible, the second fallible. The apprehension of the meaning of terms is said to be, like the first kind of perception, infallible; it is neither true nor false,[2] or in a wider sense of 'true' is always true.[3] Aristotle sometimes speaks as if the apprehension of all terms, as distinct from the judgment which unites them, were of this simple and direct type.[4] Elsewhere he describes the apprehension of 'simple entities' as of this nature.[5] But simple entities may have either of two degrees of simplicity. They may be (1) incapable of being analysed into matter and form (as 'concave' for instance is incapable, but 'snub' is not, since it involves a particular kind of matter—a nose);[6] or (2) they may be incapable of being analysed even into a generic and a distinctive element. Strictly only substance, quality, and the other categories or *summa genera* are simple in this more complete sense.[7] If we take seriously Aristotle's language when he says that it is the apprehension of simple terms that is simple apprehension, it follows that the apprehension of all other terms, since it involves the recognition of a union of form and matter, or at the least of genus and differentia, is an implicit judgment, just as the causal definition of a term is an implicit syllogism.[8] But this doctrine does not appear in the *Organon*; there the simple apprehension of *any* term is distinguished from judgment.

The Proposition

The *De Interpretatione* expresses a frankly 'representative' view of knowledge. The affections of the soul are 'likenesses of things.'[9] In accordance with this view, judgment is

affirmation and negation. Simple apprehension is also called νόησις, e.g. in *De An.* III. 6.

[1] *Met.* 1051 b24. [2] 1027 b27; *De Int.* 16 a10.
[3] *Met.* 1051 b24, 1052 a1; *De An.* 430 b28.
[4] *De Int.* 16 b27, 17 a17. [5] *Met.* 1027 b27, 1051 b17.
[6] *De An.* 429 b14, 430 b30, 431 b13; *Met.* 1025 b31, 1035 a26.
[7] 1045 a36. [8] *An. Post.* 75 b32, 94 a2, 12. [9] 16 a7.

described not as the apprehension of connections in reality but as the establishing of connections (or, in the case of the negative judgment, of divisions) between these affections of the soul, which are also called 'concepts.'[1] And, since the separating of A and B may be regarded as the connecting of A and not-B, all judgment, negative as well as affirmative, is described in the *De Anima*[2] as a 'connecting of concepts as being one',—as though judgment consisted of the tying together of concepts which formerly lay loose in the mind. Aristotle remedies the onesidedness of this description by adding that judgment may equally well be called a separation[3]—the analysis of confused complexes,[4] as well as the linking together again, in the orderly whole of a judgment, of the elements thus discovered. But so long as judgment is described as either the synthesis or the separation of concepts, the underlying view of truth and falsehood is that judgment is true when it ties together two concepts A′, B′, which are respectively 'like' two associated elements of reality A, B, or when it 'separates' two concepts which are respectively like two dissociated elements of reality; and that it is false in the two opposite cases. This crude correspondence view of truth, however, does not represent Aristotle's best thought on the subject. Elsewhere, dropping entirely the notion of 'concepts' lying about in the mind, to be tied together or pulled apart, he speaks of thought as directly concerned with reality, and says simply and truly that judgment is true when it asserts actually united elements of the real to be united, or actually divided elements to be divided.[5] To say this is to state in some sense a correspondence view of truth, but one which is free from the notion that there is a thought-structure which actually copies the structure of reality.

With regard to the proposition, or expression of judgment in words, Aristotle starts with the Platonic analysis of the sentence into a noun and a verb.[6] But he proceeds to establish definitions and distinctions of his own. A noun is 'a sound which has a meaning established by convention and has no time-reference, and of which no part taken by itself has a meaning.[7] A verb is that which, besides conveying a definite meaning as a noun does, has a time-reference and indicates something asserted *of* something else.[8]

[1] *Ib.* 9–14. [2] 430 ^{a}27. [3] 430 ^{b}3.
[4] Cf. *Phys.* 184 ^{a}21–^{b}14. [5] *Met.* 1051 ^{b}3, cf. 1011 ^{b}27.
[6] 16 ^{a}17, 17 ^{a}10, 19 ^{b}10; cf. Pl. *Soph.* 261 e ff. [7] 16 ^{a}19 f.
[8] 16^b 6–8, 19–21.

Besides the noun and the verb Aristotle recognises what, for want of better names, he calls the 'indefinite noun' and the 'indefinite verb' (e.g. *not-man, ails-not*)—indefinite because they can be asserted of all manner of things, existent and non-existent alike.[1] The *De Interpretatione*, which traces with passionate interest the possible linguistic varieties of the proposition, makes considerable play with these forms, but Aristotle is alive to the unimportance, in the life of the mind, of bare negation, and in the other logical works these forms are almost completely ignored.

What occupies Aristotle chiefly in the *De Interpretatione* is the tracing of the possible oppositions between propositions. He takes the existential judgment as the primary kind. Here we get the possible varieties:—

Man is.
Man is not.
Not-man is.
Not-man is not.[2]

(The further varieties which appear when we quantify the subject are also noted.) Any simple noun-verb proposition gives the same varieties:—

Man walks.
Man does not walk.
Not-man walks.
Not-man does not walk.[3]

But there is another type of proposition[4] which yields a greater variety of forms:—

Man is just.
Man is not just.
Man is not-just.
Man is not not-just.
Not-man is just.
Not-man is not just.
Not-man is not-just.
Not-man is not not-just.

Propositions of the type of 'man is just' are propositions in which 'the *is* is a third element asserted in addition,' 'a third noun-or-verb joined to the other two.' *Man* and *just* are the 'underlying things,' and *is* is an 'addition.'[5] Aristotle is here struggling—not very successfully—with the notion of the

[1] 16 a30–33, b12–15. [2] 19 b14–19. [3] 20 a3–15.
[4] What later logicians called the 'proposition of the third adjacent.'
[5] 19 b19–20 a3, 21 b26–33.

copula. He is aware of the distinction between the existential and the copulative *is*.[1] But he has as yet no very clear idea of their relation. He sees that the analysis of the proposition into noun and verb is not *always* sufficient. But he makes no attempt to analyse *all* propositions into subject, predicate, and copula. He sees that the copula is not an element of the proposition on all fours with the subject and predicate. But he does not point out that it is simply the expression of the act of asserting a connexion, in distinction from the elements of reality whose connexion is asserted. In the *Prior Analytics*, which represents Aristotle's maturer thought, the copula appears (as it has been happily expressed) completely disengaged from the predicate. When propositions are considered as premises of syllogism, which is the point of view of the *Prior Analytics*, it becomes necessary to isolate in *every* proposition a predicate which may become the subject of another proposition; and Aristotle accordingly formulates *all* propositions there in the form 'A is B' or 'B belongs to A.'[2]

The primary formal division of judgments is into affirmative and negative. Affirmation and negation are for the most part treated as co-ordinate, but occasionally affirmation is described as prior to negation.[3] Aristotle does not mean that it is psychologically prior. Negation is not the rejection of a previous affirmation. It is the rejection of a suggested connexion, but it is equally true that affirmation is the acceptance of a suggested connexion[4]; the two attitudes are put on the same level just as are pursuit and avoidance.[5] Aristotle has, however, probably three reasons for regarding affirmation as prior. (1) It is simpler in linguistic form. (2) A negative conclusion requires an affirmative premiss, while an affirmative conclusion neither must nor even can have a negative premiss.[6] (Yet negation cannot rest on a purely affirmative basis; the negative concluson must have a negative premiss as well. And therefore there must be ultimate indemonstrable negations no less than affirmations, viz. those which express the mutual exclusion of the *summa genera* or categories.[7]) (3) Affirmation is prior in worth since it gives us more precise information about its subject than negation does.[8]

[1] 21 ^{a}24–33.
[2] This is well brought out by Mr. Case in *Enc. Brit.* II. 512.
[3] *De Int.* 17 ^{a}8 f.; *An. Post.* 86 ^{b}33–36; *Met.* 1008 ^{a}16–18.
[4] *Met.* 1017 ^{a}31–35.
[5] *E. N.* 1139 ^{a}21 f.
[6] *An. Post.* 86 ^{b}37–39.
[7] *An. Post.* I. 15.
[8] *Met.* 996 ^{b}14–16.

Aristotle avoids two mistakes which subsequent logicians have often made. (1) He repudiates any attempt to reduce the negative to the affirmative by saying that 'A is not B' really means 'A is not-B',—as if we could escape negation 'by first of all denying, and then asserting that we have denied.'[1] And (2) he does not recognize the 'infinite' judgment as a kind alongside of the affirmative and the negative; 'A is not-B' is in his view an affirmation with an odd and unimportant kind of predicate.[2]

His division of judgments in respect of quantity is as follows:—(1) judgments about a universal, which are (*a*) universal—'every man is white,' or (*b*) non-universal—'there is a white man' or 'some man is white'; (2) judgments about individuals—'Socrates is white.'[3] The three kinds do not form a diminishing scale of generality; the non-universal judgment about a universal is true even if there be, for instance, only one white man. Judgments about universals and judgments about individuals are about different kinds of entity.[4] There is already implicit the doctrine of the *Posterior Analytics*, in which the universal is thought of in almost a purely non-quantitative way. Further, the judgment is not thought of as expressing the inclusion of the subject in the predicate, but rather the characterisation of the subject by the predicate. The predicate is never quantified; and in particular, when Aristotle comes to justify and to lay down the rules for conversion,[5] he does not refer, as formal logic does, to the distribution or non-distribution of the predicate. It is only when he comes to the syllogism that the 'inclusion' view of judgment comes to the front,[6] and when he passes from the syllogism to demonstration it once more disappears.

In the *Prior Analytics*[7] we find a different classification of judgments from the quantitative point of view. They are divided into universal, particular, and indeterminate; indeterminate judgments are such as 'pleasure is not a good.' 'Indeterminate' may seem to be only a provisional description of judgments which are really either universal or particular

[1] Bradley, *Principles of Logic*, 111.

[2] *De Int.* 19 b24–35, 20 a23–26; *An. Pr.* 25 b22 f., 51 b31–35, 52 a24–26.

[3] *De Int.* 7.

[4] *De Int.* 17 a38; *An. Pr.* 43 a25–32.

[5] *An. Pr.* 25 a14–26.

[6] E.g. in the phrases *ὑπὸ τὸ* A *εἶναι, ἐν ὅλῳ τῷ* A *εἶναι.*

[7] 24 a17–22.

but are not clearly expressed as either. Until this ambiguity has been cleared up, such judgments have, as premises of syllogism, only the value of particular judgments; and the *Prior Analytics*, which preserves the syllogistic point of view, so treats them.[1] But really a judgment like 'pleasure is not a good' is a scientific universal of the type recognised in the *Posterior Analytics*, in which the quantitative completeness of the subject is, though indispensable, not the main point, and the true formulation is not 'every A is B' but 'A as such is B.'

The *Prior Analytics*, it will be noticed, does not recognise the singular judgment as a separate kind. In the discussion of the figures of syllogism[2] no singular judgment appears either as a premise or as a conclusion. The reason for this omission of the singular judgment appears from a passage[3] in which Aristotle, after recognising three types of entity—individuals, *summa genera*, and the classes which include individuals and are included in *summa genera*, adds that 'discussions and enquiries are mostly about things of this last type.' The *De Interpretatione*, which considers the judgment in itself, recognises the singular judgment as a separate kind; the *Prior Analytics*, which considers judgments with a view to their value in actual reasoning, takes account of the fact that both scientific and dialectical reasoning is for the most part about classes, not about individuals.

Besides the quality and quantity of judgments Aristotle recognises their modality. Starting as usual not with metaphysical distinctions but with those which are apparent in the ordinary use of language, he distinguishes the judgments 'A is B,' 'A must be B,' 'A may be B.'[4] But the two latter types are presently recognised to be judgments of the second order. They are reduced to the forms 'That A is B is necessary,' 'That A is B is possible,' and are co-ordinated with the form 'that A is B is true.'[5] In the notion of the possible two moments are included. The possible must be something that involves no impossible consequence; but also it must be something whose *contrary* is not necessarily false.[6] It is thus not the contradictory of the impossible; it is that which is neither impossible nor necessary, and in view of the latter

[1] 26 ᵃ28–33. [2] *An. Pr.* I. 4–22. [3] 43 ᵃ25–43.
[4] *De Int.* 21 ᵃ34–37; cf. *An. Pr.* 25 ᵃ1 f., 29 ᵇ29–32.
[5] *De Int.* 21 ᵇ26–33, 22 ᵃ8–13.
[6] *An. Pr.* 32 ᵃ18–20; *Met.* 1019 ᵇ28–30.

characteristic 'A may be B' is convertible with 'A may not-be B.'[1] Some of the difficulties in Aristotle's treatment of the possible arise from the fact that this second moment in its nature is often ignored by him. Thus both (1) the necessary, (2) the not-necessary, and (3) the capable-of-being are said to be possible.[2] But of these the first satisfies only one of the conditions of a thing's being possible; it is not impossible. It does not satisfy the second condition, and is therefore said to be only in a secondary sense possible.[3] The actual may be said in a similarly improper sense to be possible.[4] When we turn to the distinction between the not-necessary and the capable-of-being, we find that Aristotle means by the latter the cases, in the world of chance and change, of usual but not invariable possession of an attribute by a subject; and by the former the cases in which either there is no rule which applies even for the most part, or such a rule is by exception violated.[5] It is excessively hard to be sure whether Aristotle thinks in the long run that there is a sphere of real contingency in the world.[6] He sometimes speaks as if necessity ruled in the celestial and contingency in the sublunary region. But even in the sublunary world there are necessary connexions—the connexions between a subject and its genus, differentiae, and properties. And even in the celestial region there is contingency; a planet which is here is capable of being there. The contingency attaching to the heavenly bodies, however, is only a capacity for movement, while terrestrial things have also the capability of changing in quality, of growing and diminishing, and of coming to be and passing away.

Though Aristotle mentions in his logic these metaphysical distinctions, his actual treatment of the modal types of judgment and of syllogism takes little account of them. He is content to observe that the three types of judgment exist, and to work out the inferences that can be drawn from them by opposition,[7] by conversion,[8] and by syllogism.[9]

Aristotle does not treat the hypothetical and the disjunctive judgment as types distinct from the categorical. He distinguishes, indeed, between the simple and the complex proposition,[10] but by the latter he means propositions of the type 'A

[1] E.g. *De Int.* 21 ᵇ35–37. [2] *An. Pr.* 25 ᵃ37–39. [3] 32 ᵃ20.
[4] *Met.* 1019 ᵇ32; *De Int.* 23 ᵃ6–18.
[5] *An. Pr.* 25 ᵃ37–ᵇ18, 32 ᵇ4–18; *De Int.* 19 ᵃ7–22.
[6] Cf. pp. 75–78, 80 f., 164, 201. [7] *De Int.* 12. [8] *De Int.* 13.
[9] *An. Pr.* I. 8–22. [10] *De Int.* 17 ᵃ20–22.

and B are C,' 'A is B and C,' or 'A is B, and C is D.' His treatment of hypothesis will be studied more properly under the head of syllogism.

Syllogism

The doctrine of syllogism may be fairly said to be due entirely to Aristotle. The word *συλλογισμός* occurs in Plato, but not in the sense given to it by Aristotle, and no earlier attempt had been made to give a general account of the process of inference. The nearest approach, perhaps, had been Plato's formulation of the process of logical division, which Aristotle calls a 'weak syllogism'; [1] but this is not even a first sketch of the inferential process in general. If the question be asked, what precisely led Aristotle to attack the problem, the answer must probably be that his primary interest was in laying down the conditions of scientific knowledge; this is announced as his purpose at the beginning of the *Prior Analytics*, and towards this the formal study of syllogism is the first step. Whatever other conditions it must satisfy besides, science must at least, he seems to have argued, be sure of the validity of each step it takes, and this is what observance of the rules of syllogism secures. We cannot say that Aristotle's method is to study with any great care the actual procedure of science; if he had done this—if he had studied closely even the one exact science known to him (or to us)—he might have written very differently. He would have had more to say of the analytic method, and he would have had to recognise the existence of non-syllogistic inferences no less cogent than the syllogism—those which make use of our insight into the implications not of the relation of subject and predicate but of such relations as equality, 'to the right of,' and the like; for mathematics is full of such relational inferences. Aristotle's *definition* of syllogism is quite general; it is 'an argument in which, certain things having been assumed, something other than these follows of necessity from their truth, without needing any term from outside.' [2] But it is assumed with insufficient proof [3] that this can happen only when a *subject-predicate* relation between two terms is inferred from *subject-predicate* relations between them and a third term. The justification for ignoring the other types of inference referred to above, so far as it can be justified, lies in

[1] *An. Pr.* 46 ᵃ33.
[2] *An. Pr.* 24 ᵇ18–22; cf. *Top.* 100 ᵃ25–27. [3] *An. Pr.* I. 23.

the facts that (1) they use the subject-predicate relation as well as the special relation on which they are based; the subject-predicate relation is the common form of all judgment and of all reasoning, and therefore the primary subject of logical study; and (2) while the varieties of the syllogism can be explored completely and the rules for them definitely laid down, any attempt to enumerate all the possible varieties of relational inference must fail.

It is noteworthy that much of Aristotle's terminology in this part of his work has a mathematical air—*σχῆμα* ('figure'), *διάστημα* ('distance,' used of the proposition), *ὅρος* ('boundary,' used of the term). It is not unlikely that he represented each figure of the syllogism by a different geometrical figure, in which the lines stood for propositions and the points for terms. But the terminology is borrowed not from geometry but from the theory of proportion. Not only *σχῆμα*, *διάστημα*, *ὅρος*, but also *ἄκρον* and *μέσον* were used as technical terms in this theory, and it seems that Aristotle thought of the premises in the various figures—'A predicated of B, B predicated of C' (first figure), 'B predicated of A, B predicated of C' (second figure), 'A predicated of B, C predicated of B' (third figure)—somewhat on the analogy of the various proportions (or, as we should call them, progressions), '$A : B = B : C$', '$A - B = B - C$,' etc.

Aristotle's terminology is in some respects confusing. The term which becomes the predicate of the conclusion is known, in each figure, as the 'first' term, that which becomes the subject of the conclusion as the 'last' term. This is due to the way in which he formulates the first figure, viz.:

A is true (or untrue) of B,
B is true of C,
therefore A is true (or untrue) of C,

where A is mentioned first and C last.

In the second figure the order of the terms is:

B is true (or untrue) of A,
B is untrue (or true) of C,
therefore A is untrue of C.

But the predicate of the conclusion is still called the first term, because this is its position in the first or perfect figure.

Again, the predicate of the conclusion is called the greater or major extreme, the subject of the conclusion the lesser or minor. This terminology is strictly appropriate only in the universal affirmative mood of the first figure.

A is true of all B,
B is true of all C,
therefore A is true of all C.

Here A must be at least as wide as C, and is normally wider. In the other moods there is no presumption that the predicate of the conclusion is wider than the subject, but the conclusion is thought of as the failure (when negative) or the partial success (when particular) of an attempt to include the subject in the predicate, and the predicate is therefore still called the greater extreme.

It will be seen that Aristotle's point of view here is largely a quantitative one. This comes out very clearly in his formulation of the principle of the first figure—'when three terms are so related to one another that the last is included in the middle as in a whole and the middle is included or is not included in the first as in a whole, there is necessarily a perfect syllogism connecting the extremes.' [1] Here all three terms are frankly treated in extension. But it must be remembered that this is not Aristotle's general theory of judgment, but a particular way of looking at judgments which he finds convenient when considering what can be inferred from them.

The principle just formulated is for Aristotle the principle on which all syllogism is based. For the other two figures have for him no validity independent of the first. The conclusions drawn in them do not follow directly from the premises, but from propositions which do follow immediately from them and which conform to the conditions of the first figure, i.e. to the *dictum de omni et nullo* formulated above. It is a disputable point whether Aristotle is right in declining to recognise the second and third figures as independent modes of argument. On the whole it appears that he is not. The first figure appears to be superior to the others not in directness but in naturalness. In it the movement of thought is all in one direction—from minor to major through middle term. In the second figure there is a movement from each of the extremes to the middle term and, this being so, neither of the extremes suggests itself inevitably as the subject of the conclusion. This is true, at least, when both premises are universal; from No A is B, All C is B, neither No A is C nor No C is A presents itself as the inevitable conclusion. A similar remark is true of the *affirmative* moods of the third figure. Or, to put it otherwise, in these two figures there is a certain unnaturalness inasmuch as

[1] *An. Pr.* 25 ᵇ32–35.

with regard to one term we have to change our attitude and treat as predicate in our conclusion what appeared as subject in its premise, or as subject what first appeared as predicate. The peculiarity of the fourth figure is that we there combine both these unnatural movements of thought, and, what is worse, that we do so gratuitously. In the second and third figures we *must* reverse our attitude towards one term if we are to get a conclusion at all; in most moods of the fourth figure[1] we do so unnecessarily, since a natural conclusion from the same premises is forthcoming by the first figure.

From Aristotle's treatment of the premises in extension follows his non-recognition of the fourth figure. If his *fundamentum divisionis* of the figures had been the position of the middle term, he would have had to recognise as a fourth possibility the case in which it is predicate of the major premise and subject of the minor. But his *fundamentum divisionis* is the *width* of the middle term in comparison with the extremes, and here there are only three possibilities; it may be wider than one and narrower than the other, wider than either, or narrower than either.

But Aristotle is not unaware of the possibility of the inferences which were later classed as the moods of the fourth figure. He implicitly recognises Fesapo and Fresison when he points out that from No C is B and All (or some) B is A we can by converting the premises infer Some A is not C.[2] And he implicitly recognises Bramantip, Camenes, and Dimaris when he points out that from the conclusions of Barbara, Celarent, and Darii in the first figure, All C is A, No C is A, Some C is A, we can by conversion get the further conclusions Some A is C, No A is C, Some A is C respectively.[3] Theophrastus treated these five moods as additional moods of the first figure. From this it was a short step to Galen's treatment of them as moods of a fourth figure. But it was a step which involved the adoption of a new *fundamentum divisionis* of the figures.

In dealing with the first figure Aristotle sees that the discrimination of the valid from the invalid figures is a matter of direct intuition—that we perceive directly that in some cases a conclusion follows and that in others it does not. The validity of the valid moods in the other figures he proves sometimes by conversion, sometimes by *reductio ad impossibile*, sometimes by 'exposition.'[4] The nature of this last proce-

[1] Bramantip, Camenes, Dimaris.
[2] *An. Pr.* 29 a19–26. [3] 53 a3–12. [4] ἔκθεσις.

dure is as follows: If, for example, All S is P and All S is R, 'take' one of the S's, e.g. N; then N will be P and also R, so that the conclusion Some R is P will be confirmed.[1] The appeal here is not to actual experience but to imagination; it does not appear to have much value, and it is used only in confirming the validity of moods which can be proved valid by conversion or by *reductio ad impossibile.*

From pure syllogisms Aristotle passes to modal syllogisms. He examines with unwearied care the conclusions which can be drawn from combinations of apodictic with apodictic, of apodictic with assertoric, of problematic with problematic, of problematic with assertoric, and of problematic with apodictic premises.[2] There are errors in the formal logic of this part of his work, and the doctrine of modal syllogisms was much simplified and improved by Theophrastus' adoption of the principle that 'the conclusion follows the weaker premise'; i.e. that, as when one premise is negative the conclusion is negative and when one premise is particular the conclusion is particular, so when either premise is assertoric an apodictic conclusion cannot be drawn, and when either premise is problematic only a problematic conclusion can be drawn.

We saw that Aristotle does not treat the hypothetical proposition as a separate type of proposition. It follows from this that he has no theory of the hypothetical syllogism as a type co-ordinate with the categorical. He does, however, recognise 'arguments ex hypothesi,' and two kinds of these.[3] (1) We may take first the *reductio ad impossibile.* This he analyses into two parts—one in which a false conclusion is deduced by syllogism, and one in which the proposition to be proved is proved *ex hypothesi.*[4] The hypothesis here referred to is not the hypothesis from which the false conclusion is deduced (i.e. the opposite of the proposition to be proved)—Aristotle's language forbids that interpretation. It is the hypothesis that that from whose opposite a false conclusion follows is itself true. Thus the analysis is:—It being required to show, e.g., that from Some B is not A and All B is C it follows that Some C is not A, (*a*) we assume that All C is A, and from this and All B is C infer by syllogism that All B is A (which is known to be false); (*b*) from the assumption that that from whose opposite a false conclusion follows is true, we conclude (non-syllogistically) that Some C is not A.

[1] 28 ^{a}22–26. [2] *An. Pr.* I. 8–22. [3] *An. Pr.* 40 ^{b}25 f., 41 ^{a}22–^{b}1.
[4] 41 ^{a}23–37, 50 ^{a}29–32.

(2) The ordinary proof *ex hypothesi* is also divided into two parts. It being required to prove a certain proposition, another proposition capable of easier proof is 'introduced' or 'substituted.' Then (*a*) the introduced proposition is proved by syllogism; (*b*) the original proposition is established 'by agreement or by some other hypothesis.'[1] I.e. the sequence of the original proposition from the introduced proposition is either a matter of mere agreement between the persons who are carrying on the argument or is dependent on a further hypothesis. The former is the contingency which Aristotle has chiefly in mind,[2] and the argument *ex hypothesi* is consequently for him in the main a dialectical, not a scientific argument. But, where the sequence is not a matter of mere agreement but rests on a real connexion, argument *ex hypothesi* may approach to the conclusiveness which belongs in full degree only to one of its kinds, the *reductio ad impossibile*.

Aristotle is not unaware of the objection that has been brought against the syllogism,[3] that it involves a *petitio principii*. If I argue 'All B is A, All C is B, Therefore all C is A,' it may be objected that I have no right to say All B is A unless I already know C (which is a B) to be A, and that I have no right to say All C is B unless I already know C to be A (which is implied in its being B). These objections rest on erroneous assumptions. (1) The first rests on the assumption that the only way of knowing that All B is A is to examine all the instances of B. As against this Aristotle is aware that in dealing with certain types of subject-matter (e.g. in mathematics) a universal truth may be ascertained by the consideration of even a single instance—that the generic universal is different from the enumerative. (2) The second objection rests on the assumption that, to know that All C is B, you must know it to have all the attributes involved in being B. This objection he implicitly meets by his distinction of property from essence. Among the attributes necessarily involved in being B he distinguishes a certain set of fundamental attributes which is necessary and sufficient to mark B off from everything else; and he regards its other necessary attributes as flowing from these and demonstrable from them. To know that C is B it is enough to know that it has the essential attributes of B—the genus and the differentiae; it is not necessary to know

[1] 41 ^{a}37–b1. [2] 50 ^{a}16–19.
[3] Sext. Emp. *Pyrrh. hypot.* II. 195 ff. Cf. Mill, *System of Logic*, Book II. ch. 3, § 2.

that it has the properties of B. Thus each premise may be known independently of the conclusion. And even both may be known without the conclusion being known. The drawing of the conclusion involves the 'conjoint contemplation' of the premises, and if they are not thus viewed in relation to one another, we may be ignorant of the conclusion and may even believe its opposite without thereby explicitly breaking the law of contradiction. The advance from premises to conclusion is a genuine movement of thought, the explication of what was implicit, the actualising of knowledge which was only potential.[1] And syllogism is distinguished from *petitio principii* in this, that while in the former both premises together imply the conclusion, in the latter one premise alone does so.[2]

Induction, Example, Enthymeme, Reduction.

We find repeatedly in Aristotle an opposition between syllogism (or deduction) and induction [3] as the two fundamentally different modes of advance in thought—the former from universal to particular, the latter from particular to universal, the former prior and more intelligible by nature, more compelling, the latter 'clearer to us,' more persuasive, more intelligible in terms of sensation, and making a more general appeal.[4] It is somewhat surprising, then, to find Aristotle undertaking to show that induction, like all the other modes of argument whether scientific, dialectical, or rhetorical, is at bottom syllogistic.[5] The characteristic of induction is that 'it connects the one extreme with the middle term by means of the other extreme.' Aristotle illustrates it as follows:—

'Man, the horse, the mule (C) are long-lived (A).
Man, the horse, the mule (C) are gall-less (B).
Therefore (*if B is no wider than C*) all gall-less animals (B) must be long-lived (A).'

This, it will be seen, is the 'perfect induction' of modern logic. The syllogism is valid only if the minor premise is con-

[1] *An. Pr.* 67 a12–b11; *An. Post.* 71 a24–b8, 86 a22–29.
[2] *An. Pr.* 65 a10–25.
[3] On induction in Aristotle cf. M. Consbruch in *Arch. f. Gesch. d. Phil.* V. 302–321; P. Leuckfeld, *ib.* VIII. 33–45; G. E. Underhill in *Class. Rev.* XXVIII. 33–35.
[4] *An. Pr.* 68 b35; *An. Post.* 72 b29; *Top.* 105 a16, 157 a18.
[5] *An. Pr.* II. 23.

vertible simply. But if it is so convertible, the conclusion is no wider than the premises. It might seem at first sight, then, that we have no real inference from particular to universal; but this would be a mistaken criticism. The universal 'all gall-less animals' is no wider in extent than 'man, the horse, the mule' (supposing these to be all the gall-less animals), but a genuine advance in thought and not merely in expression is made when we pass from the one to the other; for when we can say that all gall-less animals are long-lived we are further on the way towards apprehending a rational connexion. But though perfect induction is thus less nugatory than it is sometimes represented as being, the description of induction in this passage as based on a complete enumeration [1] is far from being adequate to Aristotle's notion of induction as it appears elsewhere. We find numerous arguments described as inductive, in which the conclusion is based on one instance only or on but few. [2] And if, as we are told, the first principles of the sciences are learnt by induction,[3] it is obvious that propositions of such wide generality as these cannot be based on *perfect* induction. It would seem, then, that in order to support his thesis that all valid argument is syllogistic,[4] Aristotle here allows himself to describe induction in terms which apply only to the limiting case of it, in which *all* the particulars falling under a universal are examined before a conclusion is drawn about the universal. It is to be noted that the particulars are not individuals but species—not this man and that horse, but man and the horse; induction is generally, though not always, treated by Aristotle as being from species to genus.[5] This fact makes it easier for him to treat perfect induction as the ideal to which all induction approximates. For (1) in logic and in mathematics it is possible to make disjunctions which are *a priori* seen to be exhaustive; e.g.—that of triangles into equilateral, isosceles, and scalene. An attribute of the triangle can then be inferred by perfect induction if it is known to hold good of each of its three species. And (2), holding as he did the belief in a limited number of fixed biological species, he could think it possible to examine all the

[1] 68 ^{b}23, 27, 69 ^{a}16; cf. *An. Post.* 92 ^{a}37.

[2] E.g. *Top.* 105 ^{a}13–16, 113 ^{b}17 f., 29–36; *Met.* 1025 ^{a}9–11, 1048 ^{a}35–^{b}4.

[3] *An. Post.* 100 ^{b}3; *E. N.* 1139 ^{b}29–31. [4] *An. Pr.* 68 ^{b}9–13.

[5] E.g. *Top.* 105 ^{a}13–16; but from individuals in *Top.* 103 ^{b}3–6, 105 ^{b}25–29, 156 ^{a}4–7; *Rhet.* 1398 ^{a}32 ff.

species of gall-less animals, though he could not well have thought it possible to examine all the instances of those species. The perfect induction from species to genus presupposes an imperfect induction from individuals to species.

If we consider actual arguments put forward by Aristotle and described as inductive, we find that they range from perfect induction to arguments in which a general rule is supported by reference to but a single instance. The root nature of induction seems to be, for him, that it is the 'leading on'[1] of one person by another from particular knowledge to universal. Whether one instance or a few or many or all are needed depends on the relative intelligibility of the subject-matter. When the first principles of science are said to be apprehended by induction or by perception,[2] Aristotle does not mean that these are fundamentally different methods of learning them. Where the form is easily separated in thought from the matter, as in mathematics, the mind passes from the perception of the truth in a single instance to grasping its applicability to all instances of a kind; where the form is less easily dissevered from the matter, an induction from several instances is necessary. But in both cases the same activity of 'intellection' is involved.[3] With regard to this activity Aristotle is not quite in agreement with himself. Sometimes it is represented as the work of a *νοῦς* which though in the soul is not of it but something imported into the embryonic soul from without.[4] At other times it is represented as though it were the last phase in a continuous development from sense through memory and experience,[5] and sense itself is represented as being already concerned with the universal, i.e. as grasping a universal

[1] *ἐπάγειν, ἐπάγεσθαι* are used in Plato of the 'adducing' of witnesses or examples, e.g. *Crat.* 420 d2, *Rep.* 364 c6; so too in *P. A.* 673 ᵃ15, *Met.* 995 ᵃ8. But in Aristotle the object of the verb is more usually the person who is 'led on'—*An. Post.* 71 ᵃ21, 24, 81 ᵇ5; *Met.* 989 ᵃ33; cf. Pl. *Polit.* 278 a5, and the use of *ἐπαγωγός* = 'alluring.' From this seems to come the use of *ἐπάγειν* without object = 'to make an induction,' *Top.* 156 ᵃ4, 157 ᵃ21, 34, and from this comes the usage *τὸ καθόλου ἐπάγειν ib.* 108 ᵇ10. *ἐπαγωγή* is used by other authors (e.g. Dem. 444, 24) in the sense of 'leading on' (apparently never in the sense of 'adducing'); Plato has *ἐπαναγωγή* in a similar sense, *Rep.* 532 c5.

[2] *E. N.* 1098 ᵇ3; cf. *An. Post.* 78 ᵃ34.

[3] *An. Post.* 88 ᵃ12–17, 100 ᵇ3–15.

[4] *G. A.* 736 ᵇ28.

[5] *An. Post.* II. 19; *Met.* A. 1.

character in its object, though not dissevering the universal from its individual manifestation.[1]

In considering Aristotle's theory of induction, then, we must not be too much influenced by *An. Pr.* II. 23, though this is the only passage in which he deals with it at any length. Essentially, induction is for him a process not of reasoning but of direct insight, mediated psychologically by a review of particular instances. But in the *Prior Analytics* his interest in his new discovery, the syllogism, leads him to treat induction as a syllogism, and therefore to treat it in its least important form, that in which the review of particulars is exhaustive.

Of the other modes of argument which Aristotle reduces to syllogistic form[2] little need be said. Example and enthymeme are the rhetorical forms answering to induction and syllogism respectively.[3] Example differs from (perfect) induction (1) in not proceeding from *all* the instances, and (2) in finishing by applying the general conclusion to a new particular.[4] Enthymeme differs from syllogism (or rather from scientific syllogism, for its *form* is syllogistic enough) by inferring (1) from merely probable premises, or (2) from signs—i.e. by inferring causes from effects, not effects from causes.[5] Reduction[6] is interesting, because it answers to the analytic method in mathematics, whereby the mathematician works back from the theorem to be proved to one easier of proof and leading to the proof of the other; but Aristotle does not indicate here any sense of the great importance of this method. Elsewhere he seems to realise that it is the typical method of mathematical discovery.[7]

THE LOGIC OF SCIENCE

When we pass from the *Prior* to the *Posterior Analytics* we pass from the study of the form common to all reasoning to the study of the features which distinguish scientific from dialectical or, as we might say, popular reasoning. The contents

[1] *An. Post.* 87 b28, 100 a17.

[2] *An. Pr.* II. 24–27.

[3] *An. Post.* 71 a9–11; *Rhet.* 1356 b2–5.

[4] *An. Pr.* 69 a16–19.

[5] *An. Post.* II. 27; *Rhet.* 1357 a32.

[6] ἀπαγωγή, *An. Pr.* II. 25. This seems to be in the long run the same as the syllogism *ex hypothesi*, though Aristotle does not expressly connect them. He does, however, treat ἀπαγωγὴ εἰς τὸ ἀδύνατον as a special kind of argument *ex hypothesi*.

[7] *E. N.* 1112 b20–24. Cf. *infra*, p. 199.

of the *Posterior Analytics* fall into five main parts.[1] (1) Aristotle first infers from the nature of science the conditions which must be satisfied by the propositions which are to form its premises (I. 1–6). (2) He next proves the consequential characteristics of demonstration in its character as demonstration, i.e. in so far as it aims at showing why properties belong to their subjects (I. 7–34). (3) He next examines the characteristics of demonstration considered as a means to the *definition* of properties (II. 1–10). (4) In the next section Aristotle deals with a variety of subjects which had been only cursorily mentioned in the preceding sections (II. 11–18). (5) Finally he adds to his study of demonstration an account of the process by which the immediate propositions which are its starting points themselves come to be known (II. 19).

Demonstration

All teaching and all learning, Aristotle points out, start from pre-existing knowledge. The knowledge thus presupposed is of two types of fact; it is knowledge 'that so-and-so is,' or knowledge 'what the word used means.' With regard to some things, the meaning of the words being quite clear, all that need be explicitly assumed is that the thing is so; this is true, for instance, of the law that everything may with truth either be affirmed or be denied. With regard to others (e.g. the triangle) it is enough if we know explicitly the meaning of the name; it is then sufficiently obvious that the thing exists, and this need not be explicitly stated. With regard to other things we must explicitly know both what the name means and that the thing is, e.g. with regard to the unit.[2]

With this passage we may combine that in which Aristotle points out the possible subjects of scientific enquiry.[3] These are 'the that,' 'the why,' 'if the thing is,' 'what it is.' There are in all five objects of knowledge—(1) what a name means, (2) that the corresponding thing is, (3) what it is, (4) that it has certain properties, (5) why it has these properties. These are named in the natural order of our coming to know them. The *first* of the five is never an object of enquiry, since all enquiry starts from some basis of knowledge and there is no basis prior to this. The *last* never serves as an accepted basis for further enquiry, since there is nothing further to be enquired into. Only the last four therefore are named where Aristotle is

[1] The division is Zabarella's. [2] *An. Post.* I. 1. [3] *Ib.* II. 1.

enumerating the objects of enquiry, and only the first four are referred to where he is enumerating the objects of precognition; and there only the first two are explicitly mentioned. The whole process of science is thus as follows. It starts by setting before itself a subject of enquiry, known by name. Names being purely conventional symbols, there is no need to enquire as to their meaning; it has only to be stated. The first question, then, is 'Does anything exist answering to this name?' This must be the first question, for it would be absurd to ask what a thing is, what properties it has, or why it has them, if we do not know it to exist. Similarly we should know what it is before we enquire what properties it has, since it is from the knowledge of its definition that we prove its properties. And finally it would be absurd to ask why it has certain properties if we do not know *that* it has them.

Demonstration is scientific syllogism, i.e. syllogism which is through and through knowledge and not opinion. The premises of demonstration must therefore be (1) true, while those of syllogism in general may be false. They must (2) be primary, in other words immediate or indemonstrable; for if they were demonstrable they ought to be demonstrated and therefore could not be *first* principles. They must be (3) more intelligible than and prior to the conclusions we draw from them—not in the sense that we become aware of them earlier in our mental life but in the sense that when we become aware of them we perceive their truth more clearly. They must be (4) causes of the conclusion, i.e. they must state facts which are the causes of the fact stated in the conclusion, and at the same time our knowledge of them must be the cause of our knowledge of the conclusion.[1]

These ultimate starting-points of science are of three kinds. They include (1) axioms—the propositions which you must know if you are to know anything. Aristotle includes among these, without distinction, propositions true of anything whatever, such as the laws of contradiction and of excluded middle, and propositions common to several sciences but not entirely unrestricted in their scope, such as that if equals are taken from equals equals remain—which has no meaning except in application to quantities. Of all axioms he observes that each science assumes them not in their universal form but in so far as they apply to the objects of the science; and of the laws of contradiction and excluded middle he observes that they are not normally

[1] *Ib.* 71 b9–72 a7.

included among the premises of demonstration ; we reason not from them but in accordance with them.[1]

The starting-points of science include (2) 'theses' peculiar to the several sciences. These are subdivided into (a) 'hypotheses,' i.e. the premises referred to above, which say 'that so-and-so is or is not,' and (b) 'definitions,' which say what so-and-so is. Science assumes the definitions of all its terms, but assumes the existence only of its primary objects (e.g. arithmetic that of the unit, geometry that of spatial magnitude), and proves the existence of the rest. Thus there are three objects of science—the genus which is assumed to exist, the common axioms presupposed by proof, and the attributes proved of the genus by means of the axioms ; in other words, that about which we prove, that on the basis of which we prove, and that which we prove.[2]

The three types of proposition presupposed by science are to be distinguished from a type which Aristotle does not allow it to presuppose, viz. 'postulates,' which are assumptions contrary to the opinion of the learner (i.e. not universally admitted), or propositions which should be proved instead of being assumed. They are to be distinguished also from assumptions which serve to bring the truth of the conclusion home to the student but whose truth is not required by the proof ; e.g. the geometer's assumption that the line he draws is a foot long or that it is straight.[3]

This account of the presuppositions of science provokes a comparison with the presuppositions stated by Euclid. In describing science as passing from the less familiar but more intelligible to the more familiar but less intelligible, Aristotle clearly has in mind a science which is no longer in its first stage, that of enquiry, but has been so far developed as to be capable of being stated in continuous expository form. And the only model of such a science which he had before him was that afforded by mathematics, and particularly by geometry. Euclid was only a generation later than Aristotle, and there were already in Aristotle's time *Elements of Geometry* which Euclid simply augmented and recast. It is noteworthy that almost all the examples of presuppositions and proofs in the first book of the *Posterior Analytics* are taken from mathematics.[4]

[1] 72 a16–18, 76 a38–b2, 77 a10–12, 22–25.
[2] 72 a14–16, 18–24, 76 a32–36, b3–22.
[3] 76 b23–34, 39–77 a3.
[4] See chs. 7, 9, 10, 12, 27 ; cf. 71 a3, 79 a18.

The word 'axiom' is expressly said to be borrowed from mathematics.[1] Aristotle's Axioms answer to Euclid's Common Notions, and his favourite example of an axiom, 'if equals are taken from equals equals remain,' is one of the three Common Notions which seem to go back to the time of Euclid.[2] Aristotle's ὁρισμοί (Definitions) answer to Euclid's ὅροι. And Aristotle's Hypotheses answer, to some extent, to Euclid's Postulates, for of the five Postulates two are in effect assumptions of existence—of the existence of the straight line and the circle.[3]

There are, says Aristotle, two errors which rest on a common basis. There is that of supposing that knowledge implies either an infinite regress from premise to premise in order that nothing may be accepted unproved, or else the acceptance of unproved and therefore unknown premises, and that knowledge is therefore impossible. And there is the error of supposing that knowledge is possible but proceeds in a circle,—truth being thus reduced to the mutual implication of propositions none of which are independently known to be true. The common basis of the two errors is the assumption that proof is the only way of knowledge, and against them both he affirms his principle that there are first premises which neither need nor admit of proof.[4]

When we know anything we know that it cannot be otherwise; and, if our conclusions are to be thus necessary, our premises also must be necessary. This implies that they are (1) true of every instance of their subject. But (2) the relation which they state between subject and predicate must be a *per se* or essential relation. There are four cases of the *per se*. (*a*) In the first type one term is involved in the essence of the other and in its definition; e.g. line in the essence and in the definition of triangle. A predicate which is *per se* to its subject in this sense is the *definition*, the *genus*, or the *differentia* of the subject. (*b*) In the second case one term is an attribute of the other and involves the other in *its* definition; e.g. every line is 'straight or curved,' and 'straight' and 'curved' cannot be defined without a reference to the line. A predicate which is *per se* to its subject in this sense is a *property*, or a disjunction stating alternative properties, of the subject. Attributes which belong to their subjects neither in mode (*a*) nor in mode (*b*) are mere *accidents* or concomitants of them. (*c*) Turning now from predicative to existential propositions, Aristotle adds that

[1] *Met.* 1005 ᵃ20.
[2] Heath, *Hist of Gk. Math.* I. 376.
[3] *Ib.* 374.
[4] *An. Post.* I. 3.

those things exist *per se* which are not predicated of a subject other than themselves. 'White' or 'walking' involves a subject other than itself—something which is white or is walking; but an individual substance cannot properly be used as a predicate at all, and a generic substance can only be the predicate of a subject which is not other than it but is simply a species or an individual member of it. (*d*) Those propositions are *per se* which assert not the inherence of an attribute in a subject at all, but the connexion between a cause and its effect; and those are accidental which assert a mere concomitance of two events. Senses (*c*) and (*d*) are defined by Aristotle only in order to give a complete account of the meaning of *per se*; the premises of science will, we are told, be *per se* in either sense (*a*) or sense (*b*).

But, to be in the strict sense universal, a proposition must be (3) true of its subject *qua ipsum*. The predicate must belong to the subject not only necessarily but in virtue of the specific nature of the subject, not in virtue of a generic character which it shares with other species. For thus alone will the subject contain nothing irrelevant to the predicate. From any proposed subject we must 'strip off' all irrelevant differentiae, till we come to that subject which is precisely commensurate to the predicate; the premises of science are reciprocating or simply convertible statements—such alone have the elegance which the ideal of science requires.[1]

From these conditions which the premises of science must fulfil follow certain properties of the premises. The first of these is that they will be proper or peculiar to the subject of the science. In the first place, they must not be borrowed from another science. For if the middle term is a universal, i.e. a commensurate, predicate of one genus, it cannot be a commensurate predicate of another. Thus geometrical propositions cannot be proved by arithmetical premises; they could be so proved only if spatial magnitudes were numbers. The extremes and the middle terms must belong to the same genus. Premises from one science can be used in another only if the subject-matter of the latter falls under that of the former, as those of optics and harmonics fall under those of geometry and arithmetic respectively. But in fact optics is not a science distinct from geometry, nor harmonics from arithmetic; optics and harmonics are simply applications of geometry and arithmetic respectively.[2]

[1] I. 4. 5. [2] I. 7. Cf. p. 7.

In the second place, and for the same reason, the propositions of a particular science cannot be proved by general premises. Bryso's attempt to square the circle by the use of the principle that 'things which are greater and less than the same things respectively are equal' is incorrect, because this is a principle which is as true of numbers as of spatial magnitudes, and does not take account of the special nature of the subject-matter of geometry. From this it follows that the first principles peculiar to a science cannot be proved; for they could be proved, if at all, only by general premises. It follows further that the 'axioms', which *are* common to more than one science, are not premises of the sciences, but rather the principles by virtue of which the conclusions are seen to follow from the premises.[1]

The ideal of scientific knowledge is further defined by the distinction drawn between knowledge of the 'that' or fact and knowledge of the 'why.' This distinction may be drawn (1) within the limits of a single science. We have knowledge of the 'that' and not of the 'why,' firstly when our premises are not immediate but themselves require demonstration, and secondly when we infer cause from effect, the more intelligible from the more familiar. We may infer the nearness of the planets from their not twinkling, but we are then reversing the true logical order; the *causa essendi* should also be the *causa cognoscendi*. Where, as here, the middle and the major term are convertible, we may replace an inference from effect to cause by one from cause to effect; but where they are not we cannot do so, and are thus limited to knowledge of the 'that.'

(2) One science may know the 'that' and another the 'why.' Mathematics supplies the reasons for the facts which are studied by optics, harmonics, and astronomy, and even for some of the facts studied by sciences which are not 'subaltern' to it, such as medicine. Thus one who is both a geometer and a medical man will be able to explain on geometrical grounds 'why round wounds heal more slowly than others.'[2]

It will be seen that failure to obtain knowledge of the 'why' is due to the violation of one or other of two rules previously laid down with regard to the premises of science—that they must be immediate, and that they must be more intelligible than the conclusion. Knowledge of the 'that' is thus not science proper, which is on the contrary a system in which all

[1] I. 9, 11, 77 a10–12, 22 f. [2] *An. Post.* I. 13.

that is known, save the first principles themselves, is known as flowing necessarily from the first principles.

Since the premises of science must be immediate, scientific proof may be represented as a process of 'packing,'[1] i.e. of the interpolation of the necessary middle terms between two terms which we desire to connect as subject and predicate. When Aristotle speaks in this way, he is thinking of the procedure of science as analytic, as setting before itself a theorem to be proved true or a problem of construction to be achieved, and asking what are the required premises, i.e. the conditions of the solution. But for the most part, perhaps, he thinks of science as synthetic, as starting with immediate premises and weaving them together so as to arrive at mediate conclusions. The first is in fact the method of discovery, the second that of exposition, and both play a part in the actual procedure of science.

In view of his general conception of the nature of science, Aristotle is able to state[2] the conditions under which one science is 'more exact than and prior to' another. It is so (1) if it knows both fact and reason, while the other knows only the fact; thus the astronomy which embraces mathematics as well as observation is prior to observational astronomy. It is so (2) if it studies characters in abstraction from a substratum, while the other is concrete; thus arithmetic is prior to harmonics. It is so (3) if it involves fewer presuppositions; thus arithmetic is prior to geometry because the unit has not position while the point has.

Since perception is only of particular facts, it can never do the work of demonstration. If we had been on the moon and seen the earth blocking out the light of the sun, we should still not have known the cause of lunar eclipses. We should have seen the temporary failure of light, but should not have known the general cause of the phenomenon. But while Aristotle thus emphasises the limits of perceptual knowledge, he is well aware of the part which perception plays in the growth of science.[3] Where a sense is lacking, a science will also be lacking, since the universal truths from which science proceeds are got by induction from sense-perceptions. And though we do not know the reasons of things by sense, we learn them from sense. After a certain number of experiences of a fact the universal explanation dawns upon us by an act of intuitive

[1] 79 ᵃ30, 84 ᵇ35. [2] *An. Post.* I. 27.
[3] Cf. *De Caelo*, 293 ᵃ25–30, 306 ᵃ5–17; *De Gen. et Corr.* 316 ᵃ5–10.

reason.[1] Aristotle recognises clearly the importance of the scientific imagination whereby we 'instantaneously guess the middle term.'[2]

Towards the end of the first book of the *Posterior Analytics*[3] Aristotle turns his attention to the distinction, so important for him, as for Plato, between knowledge and opinion. He first distinguishes them by pointing out the difference between their objects. Knowledge is of the necessary, opinion of the contingent, of the true which might be false or of the false which might be true. No one, he points out, would describe himself as thinking A to be B, when he thinks A cannot be otherwise; he then says that he *knows* A to be B. But, it may be said, two people may in point of fact be respectively knowing and thinking exactly the same premises, and knowing and thinking the same conclusions to follow from them. To this Aristotle answers firstly that even if they are, that does not abolish the distinction between knowing and thinking. Even if their objects are the same, the mental attitude is different; one will recognise his premise, for instance, as stating the essence and definition of its subject, the other will regard it as stating merely a fact which happens to be true of the subject. But, secondly, the objects of knowledge and of opinion are not the same any more than those of true and of false opinion. True and false opinion are 'of the same' in that they are about the same subject; but they are 'of different things' in so far as they assert different predicates of this subject. Similarly knowledge and opinion may both judge that man is an animal, but the one judges that 'animal' is of the essence of man, the other that 'animal' is an attribute which man happens to have.

Definition

In the second book Aristotle turns to consider demonstration as the instrument whereby *definition* is reached. The four great types of problem, the 'that,' the 'why,' the 'if,' the 'what,'[4] are all concerned with the middle term. To ask *whether A is* or *whether A is B* is to ask whether there is a middle term explicative of its being or of its being B; to ask *what A is* or *why A is B* is to ask what this middle term is.[5] The notion of the middle term is more easily applicable to the

[1] *An. Post.* I. 31. [2] I. 34. [3] I. 33.
[4] II. 1. [5] II. 2.

question whether (or why) A is B. We are then looking for the element in the essence of A which accounts for its having the property B. What, on the other hand, does Aristotle mean by the middle term which explains A's being *simpliciter*? There is here no question of a syllogistic middle term, for there are no two terms for it to be between; there is only the term A. 'Middle term' is here used, by an extension of meaning, simply for 'essential cause.' Aristotle means that to ask *whether* A is, is to ask whether there is an intelligible essence answering to the name, and that to ask *what* A is is to seek to unfold this essence in a definition. But the whole application of the question 'why', and of the notion of the middle term, to substances is somewhat unnatural. What Aristotle is really interested in maintaining is that the quest for the definition of an *attribute* is the quest for a middle term connecting the attribute with a subject, showing why some subject has the attribute. If the moon is eclipsed because the light of the sun is shut off from the moon by the interposition of the earth, the definition of lunar eclipse is 'the moon's deprivation of light owing to the interposition of the earth.' The true definition of an attribute, the only definition which is more than a mere account of the usage of the word, is a definition which states the efficient or the final cause of the attribute's occurrence. Thus the *demonstration* of the attribute as necessarily following from some cause requires only verbal alteration to provide its *definition*.

After a dialectical discussion purporting to show that we cannot prove what a thing is by syllogism, by division, by definition of the thing or of its opposite, or in any other way,[1] Aristotle proceeds[2] to a positive account of the relation between demonstration and definition. If we are to reach a definition by the aid of demonstration, we must start with a partial knowledge of the nature of the *definiendum*, i.e. with a nominal definition of it such as the definition of eclipse as a loss of light. We now ask whether there is any middle term by which we can prove that the moon suffers such loss. We may hit upon the middle term—'incapable of casting a shadow though there is nothing between the moon and ourselves'; i.e. we may infer the moon's deprivation of light from what is a symptom of it. This will *not* help us towards a real definition of eclipse. But we *may* hit upon the middle term which states the cause of eclipse; we may frame the syllogism 'Whatever has another

[1] II. 3–7. [2] II. 8.

body interposed between it and its source of light loses its light, The moon has another body (the earth) interposed between it and its source of light, Therefore the moon loses its light.' And this demonstration of the existence of eclipse from the existence of its cause only needs to be recast to give a definition of eclipse by reference to its cause—'eclipse is the moon's loss of light owing to the interposition of the earth between it and the sun.' Thus, given a nominal definition of an attribute or event *per genus et subjectum*, we can advance to a real definition of it *per genus et subjectum et causam*. We have not then demonstrated the definition, but we have got it by the aid of demonstration.

It is only attributes and events that can be thus defined. The primary terms of a science, on the other hand, such as unit in arithmetic, have no cause other than themselves, and of them only a nominal definition is possible, and this must simply be assumed, or made known in a way which will presently be described.[1] There are thus three kinds of definition, (1) the indemonstrable definition of a primary term, (2) the real or causal definition of an attribute or event, which packs the contents of a syllogism into a single proposition, (3) the nominal definition of an attribute or event, which corresponds to the conclusion of a syllogism without the premises.[2] These three are related to one another, it may be observed, as are Mill's laws of nature, derivative laws, and empirical laws.

Aristotle proceeds [3] to show that any one of the four causes—formal, material, efficient, or final—may function as the middle term whereby the existence of that whose cause it is is proved. It is noteworthy that the material cause appears in this passage (perhaps the earliest in which it occurs) in a different guise from that which it usually bears in Aristotle. It is described as 'the conditions from which it follows that the given thing is,' and these are identified with the premises necessary for the proof of a conclusion. In the *locus classicus* for the four causes 'the hypotheses (or premises) of the conclusion' occur as an instance of the material cause,[4] along with other more ordinary instances—the bronze of the statue, the letters included in a syllable, etc. It would seem as if we had in the *Posterior Analytics* a narrower conception from which the notion of material cause was later reached by the recognition of an

[1] II. 9.
[2] II. 10; cf. 75 b31.
[3] II. 11.
[4] *Phys.* 195 a18.

analogy between the relation of premises to conclusion and that of matter to formed thing. The chapter looks like an early product of Aristotle's thought, for it betrays considerable confusion.

Having previously shown how we pass from a non-causal to a causal definition, Aristotle proceeds[1] to consider how the former is itself established. An *infima species* is to be defined by enumerating a collection of attributes essential to it which severally extend beyond the species but collectively are coextensive with it. This method is the reverse of Plato's method of definition by division; it is the method of composition, of building up attributes one by one till we have a collection coextensive with the thing to be defined. But when Aristotle passes[2] from the definition of *infimae species* to that of genera, he allows a certain value to division. It proves nothing, it is true, but (1) it secures that the characteristics are taken in the right order. We can divide animals into tame and wild, but we cannot divide tame things into animals and anything else, since animals are the only things that can (strictly speaking) be tame. If we use the method of division, therefore, we shall avoid stating the definition of man in an irrational order such as 'tame, animal, two-footed'; we shall put the characteristics in the right order—'animal, tame, two-footed.' (2) Division, further, secures another advantage; it tells us when our definition of an *infima species* is complete. If in defining we pass from the genus to a differentia which is not proximate to it, we shall find that the whole genus is not exhausted by this differentia and its co-ordinates; not every animal is either whole-winged or with divided wings. If we keep constantly before our minds the problem of dividing the genus, we shall guard against omitting any of the intermediate differentiae which we need for the definition of the species. The three things to be kept in mind are (1) to take as marks of the species only attributes which belong to its essence; (2) to take them in the right order, proceeding constantly from determinable to determinate; (3) to take *all* the marks required to mark off the *definiendum* from everything else.

Having thus stated the respects in which definition may be aided by division, Aristotle proceeds[3] to say what else is needed for the definition of a genus. What is needed is that when the genus has been divided into its *infimae species* and these

[1] *An. Post.* II. 13. [2] 96 ᵇ15. [3] 97 ᵇ7.

have been defined, we then search for the common elements in their definitions, rejecting as irrelevant to the genus all elements which are not common to all the species. This process must not, any more than that of division, proceed *per saltum*; we must be content to proceed at each stage to the genus next above the species whose definition we have ascertained, and to reach the highest definable genus only after a process of gradual generalisation. And we must be prepared to discover sometimes that species which we expected to find to be species of one genus turn out to belong to different genera and to be called by one name only by an ambiguity. Suppose we want to define pride. What pride connotes in Alcibiades, Achilles, and Ajax is inability to put up with insult; what it connotes in Lysander and Socrates is indifference to fortune. The term therefore has no one meaning and no one definition.

In this chapter Aristotle describes well, though his meaning is not always easy to catch, the process of combined division and generalisation which actually is the true method of attaining correct non-causal definitions.

Aristotle has, at the beginning of the *Posterior Analytics*, insisted that, since science aims at 'universal,' i.e. reciprocating, propositions, in which subject and predicate are coextensive, its premises also must be reciprocating propositions. He proceeds now to ask whether cause and effect are necessarily coextensive. In its new form the question is 'can the existence of the cause be inferred from that of the effect, as well as the existence of the effect from that of the cause'[1] or (in other words) 'can there be more than one cause for one effect?'[2] Aristotle's answer is that the very meaning of cause implies that the presence of the cause can be inferred from that of the effect. If an effect is present in the absence of its supposed cause, that only shows the supposed cause not to be the real cause. Every scientific problem is a universal problem, a problem of which the subject and the predicate are coextensive; if we ask 'why has the subject C the attribute A,' we imply that it is just C (and not other things as well) that has the attribute A. Now consider the syllogism All B is A,
All C is B,
Therefore all C is A.

Here B is an essential attribute of C and is the cause of the property A. If the conclusion is convertible simply, it is

[1] II. 16. [2] II. 17.

easily seen that the premises must be so too, and therefore the cause B is coextensive with the effect A.

This doctrine, it will be seen, is true if stated, as Aristotle states it, in reference to the ideal of science. For science aims at reciprocating statements, and cannot rest content with a plurality of causes. But so far Aristotle has not taken account of the difficulties with which science in its progress has to contend. It is rarely able to specify the whole subject to which an attribute belongs; it finds the attribute occurring in this subject and in that, but does not know in what others it may occur, still less what is the genus that embraces them all. It then has to ask 'why has *this subject C* the attribute A,' and has to be content with a B coextensive not with all A but with 'A in C.' And this will often be something different from that which is the cause of 'A in D.' Then the presence of B *cannot* in *all* cases be inferred from the presence of A, and A *will* have more causes than one. This possibility of the recognition of non-reciprocal causes of an effect before we can recognise the reciprocal cause is clearly pointed out by Aristotle.[1]

The Apprehension of the First Principles of Science

The *Posterior Analytics* are for the most part occupied with demonstration, which presupposes the knowledge of first premises not themselves known by demonstration. At the end of the book[2] Aristotle comes to the question how these are known. What is the faculty by which we know them; and is the knowledge acquired, or is it latent in us from the beginning of our lives? It is hard to suppose that this, which must be the most certain of all knowledge, is in us from the beginning without our knowing it; it is equally hard to see how, if not present from the start, it can be acquired, since (unlike demonstrative knowledge) it would have to be acquired without any basis of pre-existing knowledge. To avoid both these difficulties, we must suppose that we start with a humbler faculty from which this knowledge may be developed. Such a faculty Aristotle finds in perception, the discriminative power inborn in all animals. The first stage in the development from sense to knowledge is memory, the 'remaining of the percept' when the moment of perception is over. The next stage is 'experience,' or the framing, on the basis of repeated memories

[1] 98 ^{b}25–31, 99 ^{a}30–^{b}8.

[2] II. 19, cf. *Met.* A. 1.

of the same kind of thing, of a conception, the fixation of a universal. This in turn is the origin from which develops art, in so far as our concern is with becoming, and science, in so far as our concern is with being. The passage from particulars to universals is like the rallying of a routed army through the stand made by one man after another till the whole army has returned to its original state. The transition is made possible by the fact that perception itself has an element of the universal; we perceive a particular thing, it is true, but what we perceive in it is characters which it shares with other things. From this first element of universality we pass without a break through higher and higher reaches of universality to the highest universals of all, the 'unanalysables.' The passage from particulars to the universals implicit in them is described as induction; the grasping of the universals which become the first premises of science must, we are told, be the work of a faculty higher than science, and this can only be intuitive reason.

In this magnificent account of the unbroken development from sense to reason one point (to mention no others) remains obscure. What exactly are the 'first things' which are thus known by intuitive reason? Much of the language refers to the grasping of concepts, and the first things must then be the highest, unanalysable objects of conception, the categories. But a knowledge of the categories is not a sufficient starting-point for demonstrative thought. The first premises of science are the axioms, the definitions, and the 'hypotheses,' or assumptions of the existence of the primary objects of the science.[1] It may be that Aristotle recognises this distinction here. After describing the ascent from sense-particulars to universal concepts, he says[2] 'it is clear then that it is by induction' (i.e. by generalisation from particulars) 'we recognise the "first things"; for it is thus that perception *too* produces the universal in us.' I.e. he seems to recognise, besides the advance from the perception of particulars to the conception of universals, an advance from particular judgments such as 'this thing cannot have different colours in the same part of itself' to universal judgments such as the law of contradiction and the other first principles of science.[3]

[1] I. 10. [2] 100 b3.

[3] Cf. *Met.* 981 a7, where Aristotle ascribes to *ἐμπειρία* the formation of judgments such as 'that Callias, Socrates, etc., when ill of this disease, were helped by this treatment.'

THE *TOPICS*.

The *Topics* must be more briefly dealt with. The work seems to fall into two main parts—(1) Bks. II.–VII. 2, the original treatise, a collection of *τόποι* or commonplaces of argument, borrowed to a large extent from the Academy [1]; this section seems to have been written before the discovery of the syllogism.[2] (2) Bks. I., VII. 3–5, VIII., an introduction and a conclusion written after the discovery of the syllogism but before the writing of the *Analytics*. The *Sophistic Elenchi* is probably later than the *Topics*, but earlier than the *Analytics*.

The purpose of the *Topics* is 'to find a method by which we shall be able to argue about any proposed problem from probable premises, and shall ourselves under examination avoid self-contradiction' [3]; i.e. shall be able to sustain with success either of the parts implied in all dialectical discussion—the part of 'questioner' (the main speaker who puts questions to his opponent and argues from whatever answers he receives) or that of 'respondent.' In other words, our object is to study the dialectical syllogism. The dialectical syllogism is distinguished from the scientific by the fact that its premises are not true and immediate but are merely probable, i.e. such as commend themselves to all men, to most men, or to wise men. It is distinguished on the other hand from the merely contentious syllogism by the fact that it reasons correctly from premises which are really probable, while the other reasons from premises that merely seem probable or else reasons incorrectly.[4] Dialectic has not the supreme value which belongs to science, but it is not a valueless pursuit like arguing merely for argument's sake. The study of it has three main uses—(1) With a view to mental gymnastics. (2) With a view to being able to argue with people we meet; if we have previously made ourselves familiar with the opinions of the many and with what follows from them, we shall be able to argue with people from their own premises. (3) The third use is with a view to the sciences, and this use is twofold. (*a*) If we are able to argue questions both *pro* and *con* we shall better recognise truth and falsehood when we meet them, and (*b*) the first

[1] E. Hambruch has dealt well with this point in *Logische Regeln d. Plat. Schule in der Arist. Topik* (Berlin, 1904).

[2] Maier, *Syll. des Ar.* II. 2, 78, n. 3 makes out a good case for this.

[3] 100 a18.

[4] *Ib.* 27–b25.

principles of the sciences, since they cannot themselves be scientifically proved, can be best approached from a study of common opinions such as dialectic provides.[1] The actual study of dialectic in the *Topics* is mainly from the first two points of view[2]; Aristotle does little to show how it can aid us in the study of the sciences. The statement that the first principles of science are approached by way of dialectic is nowhere brought into relation with the other statement that they are approached by induction; but we must remember that induction is one of the two modes of argument proper to dialectic.[3] (The best specimen of an establishment of first principles by dialectic is the argument in *Metaphysics Γ* for the laws of contradiction and excluded middle.)

Aristotle begins by considering the variety of relations between subject and predicate that may be expressed in the premises from which arguments proceed, or in the problems put up for discussion. The predicate of any proposition is either convertible with the subject or not. If convertible it either states the essence of the subject, in which case it is its *definition*, or does not, in which case it is a *property*. If not convertible, either it is an element in the definition, in which case it is the *genus* of the subject (or a differentia, which Aristotle here includes under genus), or is not an element in the definition, in which case it is an *accident*.[4] This is Aristotle's classification of predicables which Porphyry later muddled hopelessly by reckoning *species* as a fifth predicable. The place of species in Aristotle's account is not as one of the predicables but as the subject; for it is (with a reservation in the case of judgments assigning accidental attributes) judgments about species, not about individuals, that he has throughout in view.

In one respect Aristotle himself later modified his doctrine of predicables. In the present passage the distinction between genus and differentia is slurred over. Differentia, like genus, is treated as being wider than that whose differentia it is. The implied doctrine is one which we find also in the *Posterior Analytics*,[5] that a definition is made by collecting attributes each wider than the term to be defined but collectively coextensive with it. In the *Metaphysics*,[6] on the other hand, Aristotle lays it down that each differentia stated should be a differentiation of the previous differentia, and that the last differentia

[1] I. 2. [2] Cf. for example 105 ^{a}9. [3] *Top.* I. 12.
[4] I. 4, 8. [5] 96 ^{a}24–^{b}14. Cf. *supra*, p. 52. [6] Z. 12.

should be coextensive with the *definiendum*. And the *Posterior Analytics* [1] shows him moving towards this doctrine.

With one or other of the predicables every premise and every problem is concerned. I.e. the problems which may be put up for discussion are such as 'is *animal, with feet, two-footed* the definition of man, or not?', 'is *animal* the genus of man, or not?', and the questions which the questioner may put to the respondent (adopting the answers as his premises) are of the same types. With the problems and premises relating strictly to the predicables are grouped others more loosely related to them. Thus one single word can never be the definition of another word, yet a proposition such as 'the beautiful is the befitting' has a bearing on the problem of defining the beautiful. Again, questions as to the factual identity of two things have a bearing on the problem of definition. Factual identity does not imply that the one can be used in defining the other, but factual difference shows that it cannot.[2] In this way all problems can be brought under one or other of the predicables, and the predicables form the framework for the whole treatment of problems and of the commonplaces available for their discussion. Books II. and III. deal with problems of accident, Books IV. and V. with those of genus and property respectively, Books VI.–VII. 2 with those of definition.

Three of the main terms in the technique of dialectic are the terms 'premise,' 'problem,' 'thesis.' A dialectical premise is 'a question' (strictly, of course, an answer) 'which commends itself as probable either to all men, to most men, or to wise men.' Not every question which may properly be put to one's opponent in discussion may properly be set up as a problem for discussion. A problem must be a question possessing either practical or theoretical interest, and on which either there is no current opinion, or there is a difference of opinion between the many and the wise, or among the many, or among the wise. Again, not every problem is a thesis; a thesis is 'a paradoxical opinion of some celebrated philosopher,' or a view which, though perhaps no one holds it, can be supported by argument. Not all problems nor all theses, Aristotle adds with characteristic common sense, are worth discussing, but only those which might be put forward by people whose need is for argument, not for chastisement nor for a missing sense; we shall not discuss whether we ought to honour the gods and love our parents, nor whether snow is white.[3]

[1] 96 ^{b}30–32, 97 ^{a}28–^{b}6. [2] *Top.* I. 5. [3] I. 11.

We have neither the space nor the wish to follow Aristotle in his laborious exploration of the τόποι, the pigeon-holes from which dialectical reasoning is to draw its arguments. The discussion belongs to a by-gone mode of thought; it is one of the last efforts of that movement of the Greek spirit towards a general culture, that attempt to discuss all manner of subjects without studying their appropriate first principles, which we know as the sophistic movement. What distinguishes Aristotle from the sophists, at any rate as they are depicted both by him and by Plato, is that his motive is to aid his hearers and readers not to win either gain or glory by a false appearance of wisdom, but to discuss questions as sensibly as they can be discussed without special knowledge. But he has himself shown a better way, the way of science; it is his own *Analytics* that have made his *Topics* out of date.

Sophistic Elenchi

An interesting appendix to the *Topics* is formed by the *Sophistic Elenchi*. This phrase means strictly 'sophistic confutations,' the sophist being regarded primarily as the negative spirit who sets himself to puzzle the plain man by the apparent refutation of his cherished opinions. But the methods of sophistic refutation are those which the sophist will use in proving his own theses as well; and the book is thus a study of fallacy in general. Aristotle's classification of fallacies, on which all other classifications of them are based, is as follows. They are of two main kinds, those which depend on the language used and those which do not. The fallacies *in dictione* are [1]:—

(1) Equivocation, i.e. ambiguity in a single word.

(2) Amphiboly, i.e. ambiguity in the structure of a sentence (easily illustrated in Greek, in which the order of the words is no sure evidence of which word is subject and which object).

(3) Composition, due to coupling words wrongly together. A man is capable of walking, when he is sitting; but it does not follow that he is capable of walking when he is sitting.

(4) Division, due to separating words wrongly. Five is two and three; but it does not follow that five is two and is three.

(5) Accent, i.e. misinterpretation of written speech by accenting a word wrongly (e.g. with a circumflex instead of an acute accent).

[1] Ch. 4.

(6) Figure of speech, i.e. mistaken inference from the grammatical form ; e.g. to suppose that 'ailing' is an action because it has the same inflexion as 'cutting' or 'building.'

The fallacies *extra dictionem* [1] are :—

(1) Accident, the supposition that whatever is true of a thing is true of each of its accidents, or *vice versa*. If Coriscus is other than Socrates and Socrates is a man, it does not follow that Coriscus is other than a man.

(2) *A dicto secundum quid ad dictum simpliciter.* If that which is not is the object of opinion, it does not follow that it is, simply. Again, if a thing has opposite qualities in different parts of itself, it is not correct to predicate both qualities of it absolutely.

(3) *Ignoratio elenchi*, due to not realising what refutation implies ; the attribute which the subject is proved not to have must be the very same attribute it was asserted to have, not an attribute called by the same name and perhaps an ambiguous name at that ; it must be proved not to belong to the subject in the same respect, relation, manner, and time, in which it was asserted to belong to it ; and the refutation must follow necessarily from the given premises. We do not prove that two is both double and not double if we point out that it is the double of one but not the double of three.

(4) *Petitio principii*, i.e. (*a*) proving a proposition by assuming the very same proposition, or (*b*) proving it from premises which ought to be proved by means of it, as when parallels are constructed by a method which itself presupposes the construction of parallels. The formal varieties both of real and of apparent *petitio principii* are explained elsewhere by Aristotle.[2]

(5) Consequent, i.e. converting simply a proposition which should not be so converted. This is illustrated by mistaken inferences from perception (as when a yellow substance which is really gall is taken for honey because honey is yellow), and by the mistaken use of the proof by signs.

(6) *Non causa pro causa*, in which the obvious falsity of a conclusion is alleged to refute a proposition which is not really one of the premises from which the conclusion follows. E.g. 'If soul and life are the same thing, then since coming into being is contrary to destruction, the contrary of a particular destruction will be a particular coming into being ; but death is a destruction and is contrary to life ; therefore life is a coming into being.

[1] Ch. 5. [2] *An. Pr.* II. 16 ; *Top.* VIII. 13.

But this is impossible; therefore soul and life are not identical.' The proposition which it is attempted to disprove was not used as a premise, and is therefore not disproved by the false result.

(7) Many questions, e.g. 'are all these things good or not good?', when in fact some are good and some are not.

Aristotle's doctrine of fallacies is not of equal value throughout. Some of the fallacies are mere plays on words which would not take in even the most innocent. Others, though more deceptive, are highly artificial. But in some of the fallacies—equivocation, accident, *a dicto secundum quid ad dictum simpliciter, ignoratio elenchi, petitio principii,* consequent, *non causa pro causa*—he has laid his finger on those most important of all fallacies which are not adopted for the deception of others but deceive the speakers themselves;[1] his treatment takes account of many of the subtlest dangers to which reasoning is exposed; and in this, as throughout his logic, he is a pioneer.[2]

The classification is by no means perfect. Aristotle himself observes that certain false arguments may be classed under more than one of his fallacies,[3] and that all the fallacies may be treated as varieties of *ignoratio elenchi.*[4] But later theorists have found it necessary to follow the main lines of his treatment, and where they have diverged from it have rarely made things better. In many cases his meaning has been misunderstood, and in others counsel has been darkened by the wilful application of his terms to entirely different types of fallacy.

[1] 167 ^{b}35.

[2] Cf. his statement that in the treatment of dialectic (unlike that of rhetoric, for example), he has had to build up the science from the beginning. *Soph. El.* 183 ^{b}16–184 ^{b}3.

[3] 167 ^{a}35, 182 ^{b}10.

[4] Ch. 6.

CHAPTER III

PHILOSOPHY OF NATURE

ARISTOTLE'S classification of the sciences, as we have seen, divides them firstly into the theoretical, which aim at knowledge for its own sake, the practical, which aim at knowledge as a guide to conduct, and the productive, which aim at knowledge to be used in making something useful or beautiful. The theoretical sciences are subdivided into 'theology' (or metaphysics), physics, and mathematics. Physics deals with things that have a separate existence but are not unchangeable (i.e. with 'natural bodies' which have in them a source of movement and rest), mathematics with things that are unchangeable but have no separate existence (i.e. with numbers and spatial figures which have only an adjectival existence, as qualifying substances); theology with things that both have separate existence and are unchangeable (i.e. with the forms which exist free from any connexion with matter); it owes its name to the fact that the chief of these pure forms is God.[1] 'Physics' as thus defined is expounded by Aristotle in a long series of works. That these are thought of as forming a unity is indicated by the opening of the *Meteorologica*; Aristotle there claims to have dealt (1) with the first causes of nature (i.e. the constituent elements which in *Physics* I., II. he shows to be involved in all change), and with natural movement in general (*Physics* III.–VIII.); (2) with the order and movement of the stars (*De Caelo*, I., II.), the number and nature of the bodily elements and their transformation into each other (*De Caelo*, III., IV.); (3) with coming to be and passing away, in general (*De Generatione et Corruptione*). He proposes to deal (4) with 'the things that happen in accordance with nature, but a nature less ordered than that of the first (or celestial) element, in the region that borders most closely on the movement of the stars'[2] (*Meteorologica*); and (5)

[1] *Met.* 1025 b18–1026 a19.

[2] *Meteor.* 338 a26–b3.

with animals and plants both in general and according to their kinds (the biological works).

The movement, it will be seen, is from general to particular.[1] The *Physics* deals in fact with natural body in general, with the common nature of all those bodies which have in themselves a source of movement and of rest. This includes not only living bodies but the elements and their inorganic compounds; these also have an innate tendency to movement—either in a circle, or from or towards the centre of the universe. Even manufactured things have a natural movement, inasmuch as their materials are natural bodies; but their movement as manufactured things is something imposed on them by the hand of the craftsman who makes them and of him who uses them.[2]

The *Physics* announces itself as dealing with 'the science of nature,' but offers at the start no account of what is meant by 'nature.' There lay behind it a whole series of works 'on nature,' for this had been a favourite title with the pre-Socratics; and in the light of these earlier works Aristotle could count on his meaning being sufficiently plain. He would be understood as intending to deal both with the ultimate stuff of which material bodies are made and with the nature and causes of the changes discernible in them. The importance of discovering causes is emphasised at the outset. The facts of experience are represented as a confused mass which must be analysed until we see its ultimate implications, the 'origins,' 'causes,' or 'elements' which are 'clear by nature' though to us initially obscure.[3] Different views may be taken of these originative causes. But there is one view, Aristotle points out, which amounts to the abolition of natural philosophy—the view that reality is single, undivided, and unchangeable. We must take it as established by experience that change exists, and we must make this our basis. But Eleaticism has played so large a part in Greek thought that Aristotle cannot brush it aside by a mere appeal to experience; he proceeds to point out various confusions on which it rests.[4]

Substratum, Form, Privation

The views of the 'natural philosophers' (as opposed to the Eleatics, who in principle denied the existence of nature) are

[1] *Phys.* 184 ᵃ23, 200 ᵇ24. [2] 192 ᵇ9–20. [3] *Ib.* I. 1. [4] I. 2, 3.

of two main kinds. Some hold that there is one kind of underlying body from which all other things are generated by condensation and rarefaction. Others hold that there are fundamental qualitative differences between things but that all things have been sifted out of a single mass in which all the 'contrarieties' were present. The latter view is subjected to criticism.[1] What Aristotle finds common to all previous schools is that they recognise contraries as first principles. Rare and dense, solid and void, being and not-being, up and down, before and behind, straight and curved—such opposites play important parts in all the earlier theories. This follows from the nature of first principles. (1) They must not be generated one from another, nor from other things, and (2) all other things must be generated from them. The primary contraries, whatever they are, evidently satisfy these conditions. But the doctrine may be confirmed by a more elaborate argument. Everything in the world requires a particular character in that on which it is to act or which is to act on it—if we rule out accidental connexions. The white can come to be out of the musical only because the not-white *happens* to be musical; strictly it comes into being out of the not-white, i.e. from what is black, or intermediate between black and white. And intermediates are formed by a mixture of contraries, so that at bottom what change to any state presupposes is the contrary of that state.[2]

There are thus at least two first principles. There cannot be an infinite number. For (1) if there were, being would be unknowable; (2) substance is one genus, and one genus has only one fundamental contrariety; (3) it is *possible* to derive reality from a finite number of principles, and a simple explanation, where it is possible, is better than a more complex one; (4) some contraries are obviously derivative, but first principles must be eternal, non-derivative. But we cannot cut our principles down to two, as economy might suggest. For (1) density does not act on rarity nor *vice versa*; love does not bring together strife nor does strife separate love; there must be a third thing which the one brings together and the other divides. (2) There seems to be nothing whose substance is through and through one of two contraries. Contraries are essentially adjectival; they presuppose a substance in which they inhere. (3) Substance is never contrary to substance. To treat contraries as the first principles, then, is to derive substance from

[1] I. 4. [2] I. 5.

non-substances; but there can be nothing more primary than substance. We must, then, presuppose a *tertium quid*, recurring in this to the view of the early thinkers who supposed a single material substratum of all things. But we must not identify this ultimate substratum with any one of the obvious elementary bodies; fire, air, earth, and water include contrarieties in their nature—e.g. fire moves up, earth down. It would be more reasonable to identify the substratum with something intermediate between the four 'elements.'

A single substratum, and contraries differing by excess and defect of some quality,—these are the principles which a simple study of change reveals, and these are in fact the principles at which earlier thought has arrived. Nothing is gained, and something is lost, by recognising more than three principles. Of passive principles one is clearly enough; but if we allow more than one pair of contrary active principles, each pair will require a separate passive principle to work on. Besides, substance, being a single genus, can only have principles distinguished by order of priority, not generically different fundamental principles. We are safe then in saying that there are neither less than two nor more than three first principles.[1]

We speak of two different sorts of thing as coming to be; we say 'the man becomes musical' and we say 'the unmusical becomes musical.' In the former case that which becomes persists, in the latter it passes away. But whether we say 'a becomes b' or 'not-b becomes b,' what always happens is that a-not-b becomes ab. The product *contains* two elements (a substratum and a form), but a third element is *presupposed* by the change (the privation of the form). The substratum, before the change, was numerically one, but included two distinguishable elements—that which was to persist through the change and that which was to be replaced by its opposite. Thus we get three presuppositions of change—matter, form, privation.[2] Earlier thinkers had been baffled by the problem of becoming; that which *is* apparently could not come to be out of that which *is*, nor yet out of that which *is not*. Aristotle solves the difficulty by pointing out (1) that nothing comes into being simply from not-being. A thing comes into being from its privation, which is indeed *simpliciter* not-being, but it comes into being from it not *simpliciter* but incidentally; it could not come into being from bare privation, but only from privation in a substratum. And again nothing

[1] I. 6. [2] I. 7.

comes into being *simpliciter* from being. It comes into being from that which incidentally is, but not from it as being, but as not being the particular thing that comes to be. (2) The difficulty is removed by the distinction of grades of being—potentiality and actuality; a thing comes from that which is it potentially but not actually.[1]

The matter and form of physical things, it must be noted, are elements distinguishable by thought but inseparable in reality. Matter never exists bare but always informed. It exists with at least so much form or definite character as is implied in its being either aether or fire or air or water or earth; these are the simplest 'natural bodies.' And if form sometimes exists bare, it is not the form of physical things that does so; the only pure forms are God, the intelligences that move the spheres, and perhaps human reason before and after its period of union with a body. And secondly we must note that privation is not a third element involved in the nature of a thing *as being*; to have one form is *ipso facto* to be deprived of the opposite form, and the latter fact need not be mentioned as well as the former. It is in studying the *becoming* of things that the phase of privation has to be recognised—hence its importance in the *Physics* and its comparative unimportance in the *Metaphysics*.

The substratum, Aristotle adds, does not come into being nor pass away. If it were generated, it would imply a persisting substratum from which it was generated—but that is just its own nature; if it were destroyed, some other substratum would persist. Thus it would have to *be* before it came into being, and to be destroyed before it could be destroyed.[2]

Nature

The second book of the *Physics* falls into three main parts. Chapter I discusses the meaning of 'nature'; chapter II the distinction between physics and mathematics; chapters III–IX the 'causes' which physics must recognise. Aristotle begins by distinguishing things which exist by nature from those which do not. The former are (1) animals and their parts, (2) plants, (3) simple bodies. The obvious distinction is that these have as such in themselves a source of movement or rest, while manufactured things have a tendency to move (e.g. up or down) not as such but in virtue of the material of which they

[1] I. 8. [2] I. 9.

are made. Aristotle does not always include in his account of 'nature' the notion of a principle of *rest*, and the heavenly bodies have in fact, according to him, no such tendency. But they are not mentioned here among 'things that exist by nature,' and besides he has not yet established their existence as never-resting, always-moving things. All natural processes except the motion of the heavenly bodies—the upward and downward movement of terrestrial elements and their compounds, the growth of plants and animals, qualitative change—have a *terminus ad quem* at which they naturally come to rest.

Aristotle habitually speaks as if in the upward or downward movement of the elements and their compounds, and in the movements of animals, there was an initiation of movement from within, and this is in fact the distinction he draws between natural and manufactured objects. But when he comes to examine whether motion can ever begin or cease he points out that this apparent initiation of movement is not a real initiation. (1) The local movements of animals are due to the movements set up in their bodies by food and nourishment and the consequent processes of sensation and desire set up in their souls.[1] And (2) the 'natural' movements of inanimate bodies are not initiated by themselves but *either* by that which removes the obstacle to their natural movement, *or* by that which generated them and made them light or heavy respectively (i.e., presumably, by the 'primary contrarieties' heat and cold, which are the principles operative in the production of physical bodies). Inanimate bodies thus have in themselves 'a beginning of being moved' but not 'a beginning of causing movement.'[2]

Nature, then, is 'innate impulse to movement.' That this exists is obvious from experience and needs no proof. To argue for its existence would be to put oneself in the position of a blind man who has to argue about colour because he cannot apprehend it directly. Two main views are held, Aristotle points out, with regard to the 'nature' of things. Some thinkers find it in matter, in 'that which is directly present in a given thing, being in itself unshaped.' People speak thus of wood as being the 'nature' of a bed, its persisting relatively unshaped material. But wood may itself be a transient character imparted to something more fundamental, e.g. earth, which will then be the 'nature' of wood. Hence fire, air, water, earth have all been described as being the nature of

[1] 253 a7–20, 259 b1–16. [2] 254 b33–255 b31.

things, the eternal stuff of which all other things are passing modifications. Others identify the nature of things with their form as it is stated in their definition, the character which they have when fully developed. This Aristotle holds to be more properly the nature of a thing than is its material, since a thing is what it is, has its nature, more fully when it exists actually, when it has attained its form, than when it exists potentially, i.e. when the mere matter for it exists.[1] He habitually identifies nature as power of movement with nature as form. The form or mode of structure of a thing—e.g. of an animal—is just that by virtue of which it moves, grows, and alters, and comes to rest when it has reached the terminus of its movement. And conversely the power to move, grow, and alter in a certain definite way is just the form or character of each thing.

Beside these uses of the word 'nature' in Aristotle we have to recognise its use in many phrases of which 'nature does nothing in vain' is a typical specimen. Nature is here to be thought of not as a transcendental principle but as a collective term for the natures of all 'natural bodies' working harmoniously together.

Physics and Mathematics

Aristotle proceeds[2] to define the character of physics (1) by comparing its object with that of mathematics, (2) by considering whether it studies nature as matter or nature as form. (1) In the first question he finds a difficulty. The bodies studied by physics have in them 'planes and solids and lines and points' which are subjects of mathematical study. The subjects of the two sciences are thus in a sense the same; how then are we to distinguish the sciences? The answer is that the mathematician studies these things indeed but not as 'limits of a physical body.' The objects of mathematics, though in fact inseparable from physical, movable body, are studied in abstraction from movement, and this abstraction involves no error. The mistake made by the ideal theory of Plato is that of attempting to abstract from matter entities in whose very nature, unlike that of mathematical objects, matter is involved. Odd and even, straight and curved, number, line, figure can be studied out of connexion with movement; flesh, bone, man cannot. They are to the objects of mathematics—to use Aristotle's favourite illustration—as

[1] II. 1. [2] II. 2.

'snub' is to 'curved.' 'Snub' is a term which can only be defined as a certain quality—concavity—of a certain physical object—a nose; 'curved' can be defined and propositions can be stated about it without introducing any such reference.[1] The one is a result of abstraction, the other a result of addition or concretion.[2] The mathematician makes abstraction of everything sensible—e.g. of weight and lightness, hardness and softness, heat and cold.[3] He leaves only what is quantitative and continuous, and its attributes as such. Arithmetic deals with quantity discrete or unextended, geometry with quantity continuous or extended.[4] Geometrical objects have a certain matter, but it is pure extension, intelligible matter, not sensible, physical, or movable matter.[5] It is what makes possible the plurality of intelligibles, as sensible matter makes possible the plurality of sensibles. But neither mathematics nor physics takes account of individual differences; the object of all science is the universal, the kind. Physics studies not the matter of this or that man but the type of matter which is found in all men and is universally the substratum of the form of man—what St. Thomas calls the *materia sensibilis communis* as opposed to the *materia individualis*. Though matter is often opposed to definition, the physicist's definition of man, or of any other species, must include a statement of the matter proper to the species.[6] Of this sensible matter of which physics takes account various stages are to be recognised. If we start with the most complex kind of physical entity, a living thing, the matter of this—that which should be specified in a full physical definition—is a certain combination of 'anomoeomerous parts,' or organs—parts divisible into sub-parts different in character from them and from one another—in which and in which alone the form of the species can be embodied. The matter of these in turn is certain 'homoeomerous parts' or tissues; the matter of these is the four elements.[7] The elements are the simplest instances of sensible matter, for the only analysis applicable to them is that into prime matter and the contrarieties hot and cold, dry and fluid, and prime matter is not sensible, never found alone in experience, merely recognisable by abstract thought.[8]

[1] *Met.* 1025 b30–1026 a10. [2] *De Caelo*, 299 a15, etc.
[3] *Met.* 1061 a28–b3. [4] *Cat.* 4 b20 ff.; *Met.* 1020 a7–14.
[5] *Met.* 1036 a2–12, b32–1037 a5; *De An.* 403 b17.
[6] *De An.* 403 a25–b12; *Met.* 1035 b27–31, 1037 a5–7, 1043 a14–19.
[7] *P.A.* 646 a12–24. [8] *De Gen. et Corr.* 329 a24–26.

If Aristotle's general distinction between mathematics and physics is satisfactory, a special difficulty is presented by the case of applied mathematics - astronomy, optics, harmonics, mechanics—the 'more physical parts of mathematics.'[1] These sciences treat apparently of physical bodies, yet they are mathematical in their method and Aristotle finds them commonly treated as branches of mathematics. In the present passage, nevertheless, he reckons them on the whole as physical sciences. 'Geometry considers a physical line but not *qua* physical; optics considers a mathematical line, not *qua* mathematical, however, but *qua* physical.' But his account is not entirely clear. A little earlier he seems to mean that such things as the shape of the sun and the moon may be considered both by the physicist and by the mathematician, the latter treating them 'not as the limit of a physical body.' In other words mathematical astronomy and the kindred sciences are here treated as being just like pure mathematics in that they treat of concrete realities but treat them in respect of certain attributes abstracted from their concrete reality.

Elsewhere he treats these sciences as definitely subordinate to pure mathematics in that they treat of some particular kind of lines or some particular kind of numbers.[2] But he recognises a further complication by distinguishing mathematical optics, which is a special application of geometry, from physical optics, which is a special application of mathematical optics,—and similarly with harmonics and astronomy.[3] In such a hierarchy the higher science studies the reasons for the facts which are studied by the lower.[4]

(2) It is the physicist's business to study nature in both the senses previously specified—matter and form. If we looked to our predecessors, Aristotle observes, we might suppose that physics studies matter only. But three considerations show that this is not true. (*a*) Art (which is but the imitation of nature) requires knowledge both of form and to a certain extent of matter; a doctor must know both the nature of health and that of the 'gall and phlegm' in which health is to be embodied. (*b*) The same science studies end and means.

[1] *An. Post.* 75 ᵇ14–17, 76 ᵃ22–25, 78 ᵇ35–39, 87 ᵃ31–37; *Phys.* 193 ᵇ25–30, 194 ᵃ7–12; *Met.* 997 ᵇ20–998 ᵃ6, 1073 ᵇ5–8, 1077 ᵃ1–6, 1078 ᵃ14–17.

[2] *An. Post.* 75 ᵇ14, 76 ᵃ9, 22, 87 ᵃ31–37.

[3] *Ib.* 78 ᵇ35–79 ᵃ13.

[4] *Ib.* 76 ᵃ9–13, 78 ᵇ34, 79 ᵃ10–13. Cf. p. 46.

Now the nature-as-form of a thing is the end towards which its development moves; the nature-as-matter is the means to this end. The inference drawn is that physics must study both form and matter; but the argument suggests (what Aristotle says definitely elsewhere)[1] that its study is primarily of the form of things, and of the matter only in so far as it is required for the realisation of form. (*c*) Matter is something relative, since different forms require different matters for their realisation. Therefore, since the knowledge of a relative term implies the knowledge of its correlative term, physics must study both. But it considers only forms which though separable in thought are embodied in matter; the truly separable form is the object not of physics but of first philosophy.

What is the force of this very abstract account of the subject-matter of physics? Its object is to distinguish physics from two kinds of study between which it is intermediate. It is to be distinguished on the one hand from metaphysics, the study of pure separately existing form. Now but few forms, in Aristotle's view, exist pure. God is pure form; so are the intelligences that move the spheres; so is the rational element in the human soul. With none of these has physics to do. But on the other hand it is distinct from a study which concentrates entirely on matter, which reduces a living body for instance, or an inanimate chemical compound, to its elements, and takes no thought of the structure which makes the living body or the compound what it is. Aristotle is in fact pronouncing in favour of teleology as against *mere* mechanism, in favour of studying the parts in the light of the whole instead of treating the whole as merely a sum of parts. Physics is the study not of form alone nor of matter alone but of informed matter or of inmattered form.[2]

The Four Causes

Aristotle now turns[3] to the problem of stating the causes which are at work in nature—the problem set up at the beginning of the *Physics* for solution. To know is to know by means of causes.[4] It is therefore the business of physics to learn the causes of physical change. It is necessary to specify

[1] *Met.* 1025 ^{b}27.
[2] *De An.* 403 ^{a}29–^{b}9; *P.A.* 645 ^{a}30–36.
[3] *Phys.* II. 3.
[4] *An. Post.* 71 ^{b}9–12, 94 ^{a}20; *Phys.* 184 ^{a}10–14.

for what *kinds* of causes the physicist must be on the look-out, and Aristotle's answer to this question is that there are four kinds. (1) The term 'cause' is said to be applied first to 'that out of which a thing comes to be and which is present as a constituent in the product,' as a statue is made out of bronze and has bronze in it. (2) It is applied to 'the form or pattern, i.e. the formula of what it is to be the thing in question,' as the ratio 2 : 1 is the formula of the octave. (3) It is applied to 'that from which comes the immediate origin of the movement or rest.' This cause may be found in the region of conduct (he who advises an act is the cause of it), and in that of nature (the father is cause of the child); the relation is, in general, that of agent to thing done, of producer of change to thing changed. (4) The term 'cause' is applicable to 'the end or aim'; health is in this sense the cause of our walking.

Certain important points are made in connexion with the four causes. (1) A thing has causes of more than one of these kinds. (2) Two things may be causes of one another; exercise is the efficient cause of health, health the final cause of exercise. In other words mechanism and teleology are not mutually exclusive; where A mechanically necessitates B it may be also true that B teleologically necessitates A. (3) We may, in the case of each of the four causes, state either the proximate cause of a thing, which will be commensurate with it, or a distant cause, some genus which includes the commensurate cause; the cause of health may be said to be 'a professional man' no less than 'a doctor.' (4) If A is a concomitant of B which is the cause of C, A may be said to be *per accidens* the cause of C. The true cause of a statue is 'a sculptor,' but if the sculptor is Polyclitus, Polyclitus may be said to be the cause. (5) We may state the cause of an effect B either as A, the owner of the faculty, or as 'A exercising the faculty.' The cause of a house's being built is either 'a builder' or 'a builder building.' (6) Actual and individual causes are simultaneous in origin and in cessation with their effects; potential causes are not. A house and its builder need not perish simultaneously, but if a builder is house-building, a house must be being built, and *vice versa.* (7) We should aim at stating the *supreme* cause. E.g. it may be said that a man is the cause of a house, but it is not because he is a man but because he is a builder that he is so, and a builder builds a house only because he possesses the building art; this, which causes other things to cause the effect, is itself the supreme cause.

It will be noted that of Aristotle's four causes only two, the efficient and the final, answer to the natural meaning of ' cause ' in English. We think of matter and form not as relative to an event which they cause but as static elements which analysis discovers in a complex thing. This is because we think of cause as that which is both necessary and sufficient to produce a certain effect. But for Aristotle none of the four causes is sufficient to produce an event ; and speaking generally we may say that in his view all four are necessary for the production of any effect. We have, then, to think of his ' causes ' as conditions necessary but not separately sufficient to account for the existence of a thing ; and if we look at them in this way we shall cease to be surprised that matter and form are called causes. For certainly without them no natural thing can be or come into being. Aristotle is in fact bringing together here under the general head of ' cause,' i.e. necessary condition, the two internal or constituent elements already discovered by the analysis of becoming (privation, which was a precondition but not a constituent, being omitted) and the two external conditions which naturally suggest themselves, the efficient cause or *vis a tergo* and the final cause or *vis a fronte*.

' Matter ' is not for Aristotle a certain kind of thing, as we speak of matter in opposition to mind. It is a purely relative term—relative to form.[1] It is the materials of a thing as opposed to the structure that holds them together, the determinable as opposed to the determinant. And the distinction of matter and form may be drawn at many different levels within the concrete thing. In the realm of art, iron, which is the finished product of the smelter, is matter for the founder. And in the realm of nature, the elements, which are the determinate product of prime matter + the primary contrarieties hot and cold, dry and fluid, are matter relatively to their simple compounds the tissues ; these again are matter relatively to the organs, and these are matter relatively to the living body. Prime matter, it is to be observed, never exists apart ; the elements are the simplest physical things, and within them the distinction of matter and form can only be made by an abstraction of thought. Secondary matter at all its stages does exist apart ; we find in experience, for example, not only tissues combined into organs but tissues not thus combined. And secondary matter can be severed in reality, not merely

[1] 194 ᵇ9.

thought of separately, from its form; e.g. organs may be broken up into their component tissues.

'Form' for Aristotle embraces a variety of meanings. Sometimes it is used of sensible shape, as when the sculptor is said to impose a new form on his material. But more often, perhaps, it is thought of as something which is an object of thought rather than of sense, as the inner nature of a thing which is expressed in its definition, the plan of its structure. And even sensible shapes can be thus expressed; the shape of a statue could be expressed by a mathematical formula, though necessarily a very complex one. On the whole, *μορφή* points to sensible shape and *εἶδος* to intelligible structure, and the latter is the main element in Aristotle's notion of form. Thus *λόγος* (formula or definition) and *τὸ τί ἦν εἶναι* ('the "what it was to be so-and-so," ' i.e. essence) are constantly used as synonyms for *εἶδος*. But further Aristotle often indicates the identity of form with efficient and with final cause. Yet if these are the same, 'their being is not the same.' The form is the plan of structure considered as informing a particular product of nature or of art. The final cause is the same plan considered as not yet embodied in the particular thing but as aimed at by nature or by art. But to speak thus, as Aristotle often does, is to speak abstractly. Neither nature nor art is for him a force existing by itself. Nature is a collective name for the respective natures of all natural objects, art a name for actual knowledge resident in individual artists. The final cause in art is strictly, then, a certain structure which some artist is consciously striving to embody in a particular material. The final cause in nature is a structure common to a whole *infima species*, to which individual members of the species strive without conscious purpose to give a fresh individual embodiment.

This formal-final cause is evidently also the efficient cause. For Aristotle, the mind is entirely informed and characterised by that which it knows. The form of a bed or of a Hermes, as imaginatively apprehended by an artist, is said to be actually 'in his soul,' and the form in his soul is what sets him to work to embody it in wood or in marble. And in nature, the form which is to find fresh embodiment is already present and is the cause of movement.

The leading type of this movement is that involved in reproduction. Here the male parent finds in the matter contributed by the female parent a new embodiment for the

form of the species. It will be remembered that nature in opposition to art is 'a power of movement, in the thing itself which is moved.' This definition has to be interpreted somewhat artificially if it is to cover the case of reproduction. Here the source of movement is of course not in the individual which is 'moved,' since the movement is just the bringing into being of this individual; the source of movement is in the male parent and is in the thing itself only in the sense that it is the specific nature of the parent, which identical nature is an element in the offspring when once it has been generated.

But natural movement or process has forms less radical than the production of a new individual substance. There is change of place, of quality, and of size. In what sense is the formal-final cause here also the efficient cause? Each type of material thing has, according to Aristotle, a natural movement, which it will make when not interfered with; it tends towards a definite region of the universe—fire towards the circumference, earth towards the centre. To be in that region is part of its very form,[1] and this fact operates both as final and as efficient cause. In change of quality and in growth or decay the same principle applies. The quality and size which accompany a thing's attainment of its complete development are included in its form and operate as a final and thereby as an efficient cause.

CHANCE

Aristotle passes to consider something which he finds commonly regarded as a cause additional to the four already mentioned, viz. luck and the fortuitous.[2] He tries to establish the existence of such a thing by pointing out[3] that (1) besides the things which happen *always in the same way*, and the things which happen *for the most part*, there are, by universal agreement, events which form *exceptions* to the habitual rule of nature. The same events which are thus characterised by Aristotle as happening 'neither always nor for the most part' are also characterised as happening *per accidens*, i.e. 'in virtue of a concomitant.' If B produces C, and A is a concomitant of B, or if A produces B, and C is a concomitant of B, A is said to produce C, *per accidens*. If one and the same person is an architect and is pale, 'the pale' becomes *per accidens* the cause of a house. Since there is no particular reason why an architect

[1] *De Caelo*, 311 ª1–6. [2] *Phys.* II. 4–6. [3] II. 5.

need be pale or a pale person need be an architect, a production of houses by pale persons will happen 'neither always nor for the most part.'

But (2) not all exceptional or accidental events are chance events. Chance events are, in addition, 'for an end.' I.e. they produce a desirable result that might *naturally* be an end, either (*a*) for the purposive action of human agents or (*b*) for the unconscious striving of nature.

Where marks (1) and (2) are united, we get a 'chance' connexion. E.g. a man goes to the market-place to buy; he there finds a man who owes him money, and collects his debt. This is a 'chance' connexion since (1) the recovery of the debt is in fact only an exceptional concomitant of that which was the object of his action, but (2) it might reasonably have been made an object of action by him if he had known it would ensue. Luck may thus be defined as 'the cause *per accidens* in that division of things-for-an-end which involves purposive action.'[1] It follows that the things which may become causes of a chance result are quite indeterminate; no rule can be laid down to limit them, and the popular opinion is justified which regards chance as something indeterminate and obscure to man. Further, there is sense in the view that nothing happens *by* chance. Chance is not an operative cause but only a name for a certain kind of connexion between events.

Aristotle proceeds[2] to distinguish luck from the fortuitous. Properly, 'the fortuitous' is the wider term, and applies (1) to lucky events, i.e. to those fortuitous events which happen to beings which can act as a result of deliberate choice. Luck is the occurrence, as a mere concomitant of the actual result of deliberate action, of what might naturally have been made an object of such action. It is inapplicable to inanimate things, lower animals, and children. The fortuitous includes (2) (*a*) similarly concomitant results of the activity of things not having deliberate choice, as when a horse is rescued from ill-users by the accident of coming to the place where its owner is. Here the cause of the horse's going in this direction is something external to it. But the difference between the fortuitous and luck is seen best, Aristotle remarks, in (*b*) cases in which the cause is within, e.g. in the production of monstrous births which are 'by nature' (i.e. are produced by the generative impulse inherent in the male parent), though they are not 'according to nature' since the form supplied by the male

[1] 197 a5. [2] II. 6.

parent has failed to master the matter contributed by the female. Such productions are fortuitous but evidently not lucky.

Though this is the strict usage, it is to be noted that Aristotle sometimes uses τύχη (luck) in the generic sense, and τὸ αὐτόματον (the fortuitous) in the sense of species (2).

There is a discussion of the fortuitous in the *Metaphysics* which is not very easy to bring into line with that in the *Physics*. It is there divided into two kinds, which simulate the action of art and of nature respectively. These answer roughly, but only roughly, to (1) and (2) (*b*). (1) Aristotle observes [1] that health, which can be produced by the purposive activity of the doctor, can also be produced spontaneously. The doctor's activity is divided into two sections, one of thinking back from the end desired to the immediate means to be adopted, and one of acting, which starts with the immediate means and culminates in the desired effect. The second of these processes can take place without the first when the patient's body can initiate precisely that series of changes which the doctor would have prescribed, e.g. when its natural heat initiates the same set of changes which the doctor would have produced by massage. And similarly (2) there can be spontaneous or fortuitous generation simulating natural generation, when there is matter which can initiate in itself the same set of vitalising processes which in natural generation the male element sets up in the female.[2] Aristotle believes that many low forms of life are produced by such a *generatio aequivoca* from matter acted on by the heat of the sun.[3]

The defects of Aristotle's treatment of chance are evident. The distinction between the usual and the exceptional is unsatisfactory. He treats the existence of the exceptional as due to the capacity of matter for receiving more than one determination. But obviously matter when acted on by the same conditions will receive the same determination; its indeterminateness does not involve contingency. There will be exceptions to rules, but these exceptions will be according to rule. In one passage at least Aristotle recognises this.[4] And on the whole the treatment of chance in the *Physics* does not imply the existence of contingency. Every event is represented as following determinately from causes of its own.

[1] 1032 ᵃ27–29, 1034 ᵃ9–21.
[2] 1032 ᵃ30–32, 1034 ᵇ4–6.
[3] *H.A.* 539 ᵃ15–25; *G.A.* 743 ᵃ35, 762 ᵃ8–15.
[4] *Met.* 1027 ᵃ25 f.

A goes to the market-place for sufficient reasons; so does B. But from A's point of view B's being there (though not his own being there) is a chance event since it flows from causes of which A knows nothing. And so to B, from B's point of view, is A's being there. Chance is simply a name for the unforeseen meeting of two chains of rigorous causation. So far we have no reason to attribute indeterminism to Aristotle.

Teleology and Necessity

Natural philosophy must, Aristotle maintains, take account of each of the four causes and refer to them all in its explanation of events.[1] But he finds himself[2] faced by a doctrine which denies the existence of final causes in nature. Empedocles had put forward the brilliant theory that existing animal species with all the apparent adaptation of their parts to ends are simply the results of natural selection by the survival of the fittest; that nature had produced an enormous variety of species—'cattle with men's faces,' and the like—and that only the fittest to survive had remained. In opposition to this theory Aristotle tries to prove the existence of teleology in nature. The observed adaptations (e.g. of teeth to the work they have to do) are, he urges, found always or for the most part. But the results of chance are never always or for the most part. Therefore the observed adaptations are not the result of chance. The only alternative is that they are for an end. But they are admittedly natural. Therefore some natural things are for an end.

The argument at first sight fails. For it rests on the assumption that apparent adaptation exists 'always or for the most part,' while Empedocles' whole theory is that the adaptations were produced in a minority of cases and that the non-adaptations have by mechanical necessity perished. But, Aristotle might argue, why do not monstrous growths go on being produced as often as normal growths? Why do animals breed true to type? The permanence of types is at bottom his chief argument for design. With the other arguments here adduced[3] we have not space to deal.

Aristotle uses much anthropomorphic language about the teleology in nature. 'Nature like a good householder throws away nothing of which anything useful can be made.' 'Nature does nothing in vain, nothing superfluous.' 'Nature behaves

[1] *Phys.* II. 7. [2] II. 8. [3] 199 ^{a}8–^{b}32.

as if it foresaw the future.'[1] To a large extent this is merely the statement of a *de facto* teleology. The world, Aristotle is maintaining, is well-ordered; i.e. everything in it is disposed so as to assure its conservation in its actual state. It is but rarely that he ascribes purposive action to God,[2] and such an ascription is inconsistent with the theology of the *Metaphysics*. It is probably to be regarded as a literary device and a concession to ordinary ways of thinking.

Aristotle turns[3] to consider whether the necessity that exists in nature is 'hypothetical' or 'simple' necessity. The popular view explains the facts of nature as due to simple necessity, effects being supposed to be determined mechanically by pre-existing causes. This is, he says, as if we were to say that a wall takes the form it does because the stones of the foundation sink to the bottom by their weight, the earth occupies an intermediate place, and the wood comes to the top. To say this is to overlook the fact that the wall exists for a purpose. It does not come into being because of its materials though it could not come into being without them. The necessity found here is, then, hypothetical necessity. It is not that B must be because A has been but that A must be because B is to be. The matter must be there because the form requires it for its realisation. Thus the primary business of the physicist is to state the form, definition, or end of whatever he is enquiring into, for from this its matter can be deduced; but he should go on to state the matter. And the full definition will contain matter as well as form.

At the same time many natural phenomena are due to simple or absolute necessity. They flow inevitably from the nature of the matter. Sometimes this absolute necessity subserves ends. The light must pass through the lantern because its particles are finer than the pores of the horn, but in doing so it serves to save us from stumbling.[4] Similarly nature uses for the purpose of making horns the surplus matter which anyhow *must* be present in the larger animals.[5] And so in many other cases.[6] But apart from the cases in which mechanism and teleology conspire together, there are cases in which

[1] *G.A.* 744 ^{b}16, ^{a}36; *De Caelo*, 291 ^{b}13, ^{a}24; *P.A.* 686 ^{a}22, etc.
[2] *De Caelo*, 271 ^{a}33; *De Gen. et Corr.* 336 ^{b}32.
[3] *Phys.* II. 9, cf. *P.A.* 639 ^{b}21 ff.
[4] *An. Post.* 94 ^{b}27–31.
[5] *P.A.* 663 ^{b}20–35, cf. 677 ^{a}15–17.
[6] E.g. *De Resp.* 477 ^{a}14–30; *P.A.* 642 ^{a}31–^{b}2, 663 ^{b}13 f.; *G.A.* 731 ^{b}20–31.

mechanism alone is at work. We must not always look for a final cause; some things are to be explained only by material and efficient causes.[1] Animals must have eyes in order to see, but the colour of them is due to the circumstances of birth and serves no end.[2] Sometimes, further, necessity opposes teleology. In the case of monstrous births this is due to defective matter.[3] In others it is due to interference by some external efficient cause, as when air and fire are dragged round by the motion of the heavens and thus do not follow their natural paths.[4] Yet this unnatural motion plays an important rôle in heating bodies on earth, and thus forms part of the course of nature.

Aristotle is not an absolute determinist. In the *De Interpretatione*[5] he denies the applicability of the law of excluded middle to statements about particular future events. To assert its applicability is to say that nothing happens by chance. If either the statement that A will be B or the statement that it will not is now true, A will necessarily be B or necessarily not be B. This would make nonsense of deliberation. As against this Aristotle asserts that deliberation and action form genuine starting-points for subsequent events. But to put the matter more generally, things which do not always energize are capable of either acting or not acting. I.e., there is contingency even apart from human action. In some cases the assertion is no more true than the denial nor *vice versa*: in others the one has a greater tendency to be true but the other *may* be true. It is necessarily true of anything that it either will or will not be, but it is not true either that it will or that it will not be. There must either be or not be a sea-fight to-morrow, but it is not the case either that there must be or that there must not be one.

Similarly in the *Metaphysics*[6] we read that a train of necessary causation may be traced back to a certain point but cannot be traced farther. This point is a cause which has no cause. There are conditions already existing which make it certain that every animal will die, but whether it will die by disease or by violence is not yet determined, and will only be determined when such an uncaused cause has come into being.

In another passage[7] Aristotle asserts that some events are

[1] *P.A.* 642 ^{a}2, 677 ^{a}17–19; *G.A.* 743 ^{b}16, 789 ^{b}19.
[2] *G.A.* 778 ^{a}16–^{b}19.
[3] *Ib.* 767 ^{b}13–23.
[4] *Meteor.* 341 ^{a}1 ff.
[5] Ch. 9.
[6] E. 3.
De Gen. et Corr. II. 11.

clearly not necessary ; we can say of them only ' they are about to be,' not ' they will be.' Are there, then, he asks, *any* events which are absolutely necessary ? The only events of which absolute necessity can be predicated are those which form part of a recurrent series—either of a literally circular series like the orbits of the heavenly bodies, or of a metaphorically cyclical series such as the succession of the seasons, or the series cloud—rain—cloud—rain . . . , or man—seed—child —boy—man . . . This evidently leaves much detail in the history of the world the prey of contingency. Yet it is doubtful whether that is Aristotle's real thought.

Movement

Nature being a principle of movement, Aristotle turns [1] to consider what movement is. From this he will proceed to consider certain notions implied in movement. Movement is *continuous*, and the continuous is often defined as that which is divisible to *infinity*. *Place, time, void* are also thought to be implied in movement.

The Eleatics had denied the existence of movement (or change) altogether. The half-way Eleaticism of the mechanists (Empedocles, Anaxagoras, the Atomists) had denied the existence of change of quality ; there was according to them only ' mixing and divorce.' [2] On the other hand the Megaric School had abolished the continuity of movement by dividing it into indivisible unitary movements.[3] We may compare with this Plato's suggestion that movement takes place discontinuously ' in the instant.' [4] Aristotle maintains both the reality and the continuity of movement. It is according to him not a sudden replacement of one state by another but the passage between them.

Motion is ' the actualisation of that which is potentially, as such.' I.e. if there is something which is actually x and potentially y, motion is the making actual of its y-ness. The motion called building, for instance, is the bringing over of the bricks and mortar which are buildable-into-a-house, into the state of being a house. Before building began, the buildable was not yet being actualised ; when building is over, the buildable is no longer being actualised. Only when building is going on is the buildable as such being actualised, and building

[1] *Phys.* III. 1. [2] E.g. *De Gen. et Corr.* 325 ᵃ23–34.
[3] *Phys.* 232 ᵃ6–10, 240 ᵇ30–241 ᵃ6. [4] *Parm.* 156 d, e.

is just its actualisation. And motion in general is the actualising of the potential. Thus it is part of the nature of movement that the potential has not yet completely lost its potentiality and become actual; that is the difference between movement and activity.[1] In each moment of activity, potentiality is completely cancelled and transformed into actuality; in movement the transformation is not complete till the movement is over. In other words movement differs from activity as the incomplete from the complete; or, more loosely, movement is incomplete activity and activity is completed movement. Movement cannot be classed *simpliciter* either as potentiality or as activity. It is an actualisation, but one which implies its own incompleteness and the continued presence of potentiality.

The elements involved in change are—that which produces movement, that which is moved, the time in which it is moved, that from which and that into which it is moved (the latter two including not only the two places involved in locomotion but the two substantial characters involved in generation-destruction, the two sizes involved in growth and diminution, the two qualities involved in alteration).[2] Change is always between contraries or between one contrary and an intermediate (which then stands for the other contrary), or between contradictories. Leaving out of account incidental change (change attaching to *a* because of *a*'s concomitance with *b*, the real subject of change) and change attaching to *a* because *b*, the real subject of change, is part of *a*, we find that movement proper must be:

(1) from a positive term to a positive term (its contrary),
(2) from a positive term to its contradictory,
(3) from a negative term to its contradictory, or
(4) from a negative term to a negative term.

But (4) is not change since it is not between opposites. Case (3) is generation, case (2) destruction. Case (3) is change, but not movement, because only that which is, and that which is in place, can be moved. Case (2) is change, but not movement; for the contrary of movement is movement or rest, while the contrary of destruction is generation. Thus only case (1) is movement.[3]

[1] ἐνέργεια. [2] V. 1.

[3] In III. 1 Aristotle had used 'movement' as synonymous with 'change' and as including generation and destruction (200 ᵇ32–201 ᵃ16). Here he reaches greater precision of language by restricting

In order to discover the kinds of movement we must ask in which categories it falls.[1] There is no movement in respect of *substance*, since substance has no contrary ; nor in respect of *relation*, since if *a*, which is in relation to *b*, changes, the term expressing the relation may cease to be applicable to *b* though *b* does not change at all. In fact, change of relation is always incidental to some other kind of change and does not form an independent kind. There is no movement of *agent and patient* because there is no change of change, i.e. no change of which change is either the subject or the *terminus a quo* or *ad quem*. Aristotle tacitly assumes that there is no movement in respect of *time*—no doubt because he has recognised time as an element in all change and therefore not available as distinctive of any particular kind of change. It follows, then, that there are only three kinds of movement—in respect of *quality, quantity*, and *place*, in each of which there is the required contrariety. Quality, it is added, must be taken not in the sense of the essential qualities which form the differentiae of things (change in respect of these would not be movement but generation-destruction), but in the sense of the 'affective' qualities in respect of which a thing is said to be acted on or to be impassive, i.e. the qualities which are the objects of the special senses.[2] Of all four kinds of change, locomotion is the most fundamental, that which is implied in all the others ; and qualitative change and generation-destruction are implied in change of size. But Aristotle, though he points out these implications, never tries to reduce one kind of change to another ; the difference of category stands as a barrier against any such attempt.

The Infinite

The main preliminary distinction which Aristotle here draws is that between (1) the infinite in respect of addition, that which cannot be exhausted by any adding of part to part, and (2) the infinite in respect of division, that which is divisible *ad infinitum*.[3] Briefly, Aristotle's view is that number is infinite in the first sense, space in the second, and time in both. He concentrates first on the question most appropriate to physics, viz. whether

movement' so as to exclude 'change in respect of substance,' i.e. generation and destruction. Both ways of speaking occur often in his other works.

[1] V. 2. [2] This point is elaborated in VII. 3. [3] 204 a6.

there is a *body* which is infinitely great, and offers reasons for the negative view [1]—reasons borrowed mainly from his theory of the 'natural places' of the four elements and therefore somewhat inconclusive. But if there is not an infinite at all, he adds,[2] impossible results follow. (1) There will be a beginning and an end of time. (2) Magnitudes will be divisible into what are not magnitudes. (3) Number will not be infinite.

Therefore in one sense there is while in another there is not an infinite. Spatial magnitude is not actually infinite, but is infinite in divisibility. But this potentiality is not one which will ever be completely actualised, like the bronze's potentiality of becoming a statue. No spatial magnitude will ever actually be divided into an infinite number of parts. The infinite, like a day or a night, exists by one part of it after another coming into being; its actualisation, to use St. Thomas's language, is not *in actu permanente, in facto* but *successive, in fieri*.

The cases of time and of the succession of generations are *like* that of spatial magnitude in that here too the infinite exists 'by one part after another being taken,' and that, while 'that which is taken' is always finite, new parts may be taken *ad infinitum*; thus the infinite is not an individual substance like a man or a house. These cases are *unlike* that of spatial magnitude in that in the latter each part taken persists, while in time and in the succession of generations it does not—it disappears, but the supply never fails.

Aristotle next points out that the infinite in respect of addition is in a sense the same as the infinite in respect of division. Consider a finite whole. By taking equal parts of it, however small, sufficiently often you will in time exhaust the whole. But if, instead, you take successive parts diminishing in a constant ratio, you will never exhaust the whole. The whole which is finite is nevertheless 'infinite in respect of addition' in the special sense that you cannot construct it by the addition of parts *diminishing in a constant ratio*. I.e., Aristotle recognises the existence of infinite series converging to a finite sum. Space is for him an infinite convergent series; time and number are infinite divergent series. The very fact that magnitude can be divided without limit implies that number can be increased without limit. Number has a minimum but no maximum; space a maximum but no minimum.

[1] 204 b1–206 a8. [2] III. 6.

Mathematicians, he remarks,[1] do not need an infinite line, but only a finite line as long as they please. His theory is here somewhat obscure. He holds strongly that the physical world is a sphere of finite size. The mathematician cannot have a straight line greater than the diameter of this sphere present to him in sensation, and the meaning must be that he is free to *imagine* such a line if he chooses, and if he can.

The upshot of Aristotle's theory is that no form of infinite exists as a given simultaneously existing whole. No *extension* is 'infinite in respect of addition,' incapable of being constructed out of a finite number of equal finite parts. No extension is at any one time actually divided into an infinite number of parts, though it may be alternatively or successively divided at an infinite number of points. *Time* does not exist as an infinite given whole, since it is not the nature of its parts to coexist; but time unlike extension is potentially infinite in respect of addition. Time like extension is infinitely divisible but not infinitely divided. *Number* is like time potentially infinite in respect of addition. Unlike extension and time it is not infinitely divisible, since it is discrete and the unit forms a limit to its divisibility.

Place

The existence of place is proved for Aristotle [2] by the fact that where one body is, another may come to be, so that place must be something different from any of the bodies that occupy it. That it not only exists but 'has significance' is proved for him by the natural tendency of the elements to move towards, and rest in, certain places. Up and down are not merely relative to us. 'Up' is the direction in which fire moves, and 'down' that in which earth moves.

Aristotle distinguishes [3] between the 'common place' which a thing shares with other things and its proper or peculiar place. Each thing in fact is in a nest of places, one inside another, but its place proper is that which immediately contains it, i.e. which contains nothing else; and this may be taken as a first definition of place.

Place must be one of four things—form, matter, the interval between the extremities, or the extremities themselves.[4] But (1) it is not *form*. The extremities of the container and of the contained coincide, but are different, and the form of a thing

[1] 207 ^{b}27–34. [2] IV. 1. [3] 209 ^{a}31–^{b}2. [4] 211 ^{b}6–9.

is the boundary of the thing, while its place is the boundary of the containing body. (2) Because the contained often changes while the container remains, the *interval* between the extremities (i.e. the outer extremities of the contained or the inner extremities of the container) is sometimes thought to be a distinct entity. But this is not so; the interval exists not by itself but as an accident of the bodies which successively fill the vessel. If there were an interval which existed by itself and remained in itself, (*a*) there would be an infinite number of places in the same place. For when water and air change places, the parts of the water will do the same in the whole water as the water does in the vessel, i.e. will depart and leave self-subsistent places behind. And (*b*) if the vessel is moved, the place of the contained thing will be moved, so that a place will come to have another place. But on *our* view the exact or immediate place of the contained thing does not become different when the vessel is moved. The vessel is removed into a new place, but the place of its contents remains the same, viz. the inner surface of the vessel. (3) *Matter* might seem to be place if one considered the case of a thing (*a*) contained in a vessel at rest, and (*b*) continuous with its container. Matter has the same two qualities, rest (i.e. persistence through change) and continuity. The phenomenon which gives rise to the belief in place is like that which gives rise to the belief in matter; we believe in matter because *what* was air is now water, and in place because *where* air was there is now water. But the matter of a thing is neither separable from it nor contains it, while the place of a thing is separable from it and contains it; so that matter is not place.

Therefore (4) place is the *limit of the containing body*.[1] But a distinction must be drawn between a thing's vessel or containing body and its place; the vessel may be called a movable place or the place an unmovable vessel. A moving stream is the vessel rather than the place of the boat which it carries down. Thus we reach the final definition of place; it is the first unmoved limit of the container.[2] I.e., the place of a thing is the inner boundary of the first unmoved body that contains it (first, reckoning outwards from the thing). From this it follows that, while everything in the physical universe is in place, the universe is not.[3]

It is important to remember that Aristotle is not offering a theory of space. He hardly ever uses the Greek word for

[1] 212 a5. [2] *Ib.* 20. [3] 212 b20–22.

space,[1] and his view of space is to be found in his discussion of *μεγέθη*, spatial magnitudes. He is here discussing the different notion of *place*, and it is impossible to overpraise the ingenuity with which he tries to do justice to what is implied in the notion of the place of a thing, without 'multiplying entities beyond necessity.' In the inner limit of the containing body he finds something which meets the requirements, and he refuses therefore to recognise any further entity as implied in the notion.

The Void

Aristotle begins[2] by observing that those who speak of the void think of it as a kind of place; there is a plenum when a place contains the bulk which it is capable of holding, a vacuum when it does not; vacuum, plenum, and place are the same thing, but 'their being is not the same.' Those, on the other hand, who try to disprove the existence of the void do so by proving experimentally the corporeality of air, but this is beside the mark; what believers in the void mean is that there are places where there is neither air nor any other matter. The fact of movement in place is thought to support both the belief in place and the belief in a void.[3] But movement does not imply a void, because bodies can take one another's places without there being an interval separable from the bodies; this we can see in vortex-movements in liquids.[4] Again bodies can be 'packed' through the expulsion of things contained in them (e.g. of the air in water). The argument for a vacuum drawn from the expansion of bodies by growth involves itself in difficulties; it will follow that either (1) not any and every part of a growing body grows, or (2) if it does, (*a*) things grow otherwise than by the addition of body, or (*b*) there may be two bodies in the same place, or (*c*) the *whole* body must be empty, if it is increased everywhere and increased by means of an empty space within it,—all of which are impossible consequences.

Aristotle sets himself to prove (1) that there is no void *separate from* bodies.[5] Several of his arguments turn on his mistaken notion of 'natural movement.' The most elaborate argument, however, is one which may be reduced to the following form:—speed of movement varies in the ratio of the

[1] *χώρα*. [2] IV. 6. [3] 214 ᵃ22.
[4] This is what A. calls *ἀντιπερίστασις*. [5] 214 ᵇ12–216 ᵃ26.

weight of the moved body to the resistance of the medium. Therefore (*a*) that which passes through a void should take *no* time to do so, and (*b*) a light body should take no longer time to move through the void than a heavy one. But in fact nothing moves in no time, and heavy bodies always move faster than light ones.[1]

(3) There is no void *occupied by* bodies.[2] If we recognise the bulk of a body as something distinct from its sensible qualities (even though separable only in thought), we need not recognise in addition a void.

(3) There are no void *interstices in* bodies.[3] In favour of a void it had been argued that if there are differences of density between bodies there must be a void, and that if there are *not* differences of density between bodies there is no such thing as compression, and therefore either (*a*) movement never takes place, or (*b*) when it takes place the whole material universe must bulge, or (*c*) when an amount x of air passes into an amount y of water, an amount y of water must simultaneously be passing into an amount x of air. In face of this argument Aristotle first shows that a void will not help to explain the facts. Then he tries to give a positive account.[4] The alternatives (*a*), (*b*), (*c*) above *are* the only alternatives if there is no densification and rarefaction. Densification and rarefaction do occur, but the existence of a void cannot be inferred. There is a single matter of opposites which from being potentially, say, hot, comes to be so actually. Similarly the same matter serves for a big and for a little body. When water turns into

[1] It was scepticism about the truth of the latter statement that induced Galileo to drop shot of different weights from the leaning tower of Pisa, and so led to the revolutionising of dynamics.

Aristotle's views about the velocity of '*unnatural*' or impressed movement may be seen from *Phys.* 249 b30–250 a7; *De Caelo*, 301 b4–11, where he enunciates what is in germ the principle of virtual velocities. 'If A be the movement, B the thing moved, C the length through which it is moved, D the time taken, then

A	will move	½ B	over the	distance	2 C	in the	time	D.
,,	,,	,,	,,	,,	C	,,	,,	½ D.
,,	,,	B	,,	,,	½ C	,,	,,	½ D.
½ A	,,	½ B	,,	,,	C	,,	,,	D."

On this principle the theory of the balance and the lever is based in the *Mechanica* (848 a11–19, 850 a36–b6). But Aristotle sees that it is not always the case that A will move 2 B (or that ½ A will move B) over the distance ½ C in the time D, for A may be unable to move 2 B at all (*Phys.* 250 a9–19). This really shows the falsity of the principle.

[2] 216 a26–b21. [3] IV. 9. [4] 217 a10–b20.

air, the same matter, without any addition from outside, becomes actually what it was potentially. So too when air is contracted or expanded. As the same matter which was cold becomes hot, so the same matter which was hot can become hotter, without any part of it becoming hot which was not hot when the whole was less hot. Similarly the size of a sensible mass can expand without addition from outside, because the same matter is capable of occupying more or less space. Thus Aristotle explains the growth and diminution of bodies in the same way as qualitative change, as due to a matter capable of various states, i.e. 'of filling space with all possible degrees of intensity.'[1] This is the doctrine which he sets up against the doctrine of the void. Elsewhere[2] he points out the analogy between the void and the infinite. There is no actual infinite, and no actual void; but just as 'division never comes to an end,' so that the line (for example) is infinitely divisible, so we can always imagine a body less dense than any given body. Matter is continuous throughout the universe, but there is no limit to its possible tenuity.

Time

After pointing out the peculiarities in the nature of time which suggest that it is either unreal or 'hardly real,' Aristotle passes to consider its nature.[3] A plausible suggestion is that which identifies it with movement or change. But this it cannot be; for there is only one time but there are many movements, and time, further, cannot be fast or slow. Yet time *implies* change.[4] For when our state of mind does not change or we are unaware of the change, we do not think time has elapsed. When we notice change we think there has been a lapse of time, and *vice versa*. What, then, is the relation of time to movement? Spatial magnitude is continuous, and is the primary continuum. Movement is continuous because it is movement through continuous space, and time is continuous because it is occupied by continuous movement. Similarly 'prior' and 'posterior' refer primarily to space, secondly to movement, and in the third place to time. We recognise a lapse of time when we notice a distinction of before and after

[1] Joachim on *De Gen. et Corr.*, p. 124, who aptly compares this conception of matter with Kant's conception of 'the real' in the 'Anticipations of Perception.'

[2] *Met.* 1048 b9–17. [3] IV. 10. [4] IV. 11.

in movement, i.e. when we distinguish two 'nows' and an interval between them; for what is bounded by a now is time. Time is 'the number of movement in respect of before and after'; for we discriminate the more and the less by number, and the more and the less of movement by time. But time is number not in the sense of that by which we number (i.e. in the sense of pure number), but in the sense of that which is numbered; i.e. it is the numerable aspect of movement.

There follows an interesting and difficult passage [1] the object of which is to point out that as movement is recognised by observing a single moving body successively at different points, the passage of time is recognised by noting that the single character of 'nowness' has been attached to more than one experienced event. Time depends on the now both for its continuity and for its differentiation into parts, as movement does on the moved body, and the line on the point. And, Aristotle adds, if it is by virtue of its nows that time is numbered, we must not suppose that nows are parts of time, any more than points are parts of a line. There is no least time as there is no least line.[2]

Aristotle turns to consider what is meant by a thing's being 'in time.'[3] To be in time must mean (1) to be when time is, (2) to be a part or attribute of time, or (3) to be measurable by time. But to be in time is not to be when time is, any more than to be in movement or in place is to be when movement or place is. Present, past, and future are in time as being parts of it; events are in it as being measurable by it. They are contained by number (i.e. by time) as things in place are by their place. Since they are in time in this sense, there must be a time greater than anything that is in time. Therefore things that are always are not in time, for they are not contained nor measured by time. Since time is the measure of movement, it is the measure of rest; and only things that are either in movement or at rest (i.e. which either are or might be moving) are in time. Thus necessary truths are not in time. Time will never fail because movement will never fail, and because each now is by its nature the beginning of a future as well as the end of a past.[4]

Aristotle raises, without very definitely answering, an important question when he asks whether there would be time if there were not soul.[5] It might be urged, he points out, that

[1] 219 ^{b}9–220 ^{a}24. [2] 220 ^{a}27–32. [3] 220 ^{b}32–222 ^{a}9.
[4] 222 ^{a}29–^{b}7. [5] 223 ^{a}21–29.

if there were no one to count there would be nothing that could be counted, and therefore no number. All that could then exist would be not time but its substratum movement; i.e. there would still be movement, but it would have no measurable aspect.

The movement of which time is the number may be either generation or destruction, growth, qualitative change, or locomotion; but movement is naturally measured by means of its primary kind, locomotion, the only kind of movement which proceeds at a constant rate.[1] And the primary kind of locomotion is that in a circle. Hence the early view which identified time with the movement of the celestial sphere, and also the view which describes human affairs and all change and time itself as cyclical.

CONTINUITY

By way of preliminary to his discussion of continuity, Aristotle proceeds to define certain fundamental terms.[2] A is *consecutive* to B when it is after B in some respect (in position, kind, etc.) and nothing in the same class is between them. A is *in contact* with B when their extremities are in the same immediate place. A is *continuous* with B when the limits whereby they touch each other are one. Contact implies consecutiveness but not *vice versa* (e.g. numbers may be consecutive but cannot touch); and continuity implies contact but not *vice versa*.

From this definition of the continuous it follows that no continuum can be composed of indivisibles—no line, for instance, of points.[3] For (1) an indivisible has *no* extremities, and (2) if a line were composed of points, these would have either to be continuous or to touch. Continuous, as we have seen, they cannot be. Nor can they touch. For (*a*) the whole of one would have to touch the whole of another, or (*b*) part of one a part of the other, or (*c*) part of one the whole of the other. (*b*) and (*c*) are impossible because points have no parts; but if (*a*) whole touches whole they will not be continuous, for what is continuous must have parts separate in place.

Further, point cannot be consecutive to point (which is a precondition of touching), nor moment to moment, since there is a line between any two points and a time between any two moments.

[1] 223 ^{a}29–224 ^{a}2. [2] V. 3. [3] VI. 1.

(3) If the continuous were composed of indivisibles it could be divided into indivisibles. But, if it were, indivisible would touch indivisible, which as we have seen it cannot do.

(4) If extension is composed of indivisibles, movement over that extension must be composed of indivisible movements, i.e. (as Aristotle proves) of completed movements which were never in course of being executed. Thus that which moved continuously would also be continuously at rest.

(5) Aristotle adds a most elegant proof of the infinite divisibility of time and space.[1] Let A be faster than B and let B have moved distance CD in time EF. A will then have moved that distance in a less time EG. Therefore B will in time EG have covered a less distance CH. Therefore A will have moved distance CH in a shorter time, and so *ad infinitum.* We are led without limit to ever shorter times and distances.

There follows a brief discussion of the paradoxes whereby Zeno had tried to show the impossibility of movement.[2] Aristotle discusses them more in detail elsewhere [3]; the essence of his reply is that, while it is impossible to traverse an infinite space in a finite time, it is possible to traverse an infinitely divisible space in a finite time, since a finite time is itself infinitely divisible.

The remainder of Book VI of the *Physics* has a double interest. It develops the doctrine of the continuity and infinite divisibility of space, movement, and time into a series of propositions admirably deduced from Aristotle's fundamental principles; and in doing so it supplies some of the premises needed for the proof of the existence of an unmoved first mover. The chief notion, perhaps, which has to be grasped to make his meaning intelligible is that of the 'first' time of a movement. An event is in a nest of times as a body is in a nest of places; the death of Cæsar took place in March B.C. 44 and also in B.C. 44 and also in the first century B.C. The 'first' time of an event is the time it precisely occupies, its exact or commensurate time. There is in this respect a close analogy between Aristotle's treatment of time and his treatment of place.

We must be content here to set out the main contents of the book in skeleton form:

Ch. 3. The moment is indivisible, and nothing moves or rests in a moment.

4. 234 ^{b}10–20. Whatever changes is divisible.

[1] 232 ^{a}23–233 ^{a}21. [2] 233 ^{a}21–^{b}15. [3] VI. 9, 263 ^{a}4–264 ^{a}6.

4. 234 b21–235 a13. Motion is divisible (*a*) in respect of the time it occupies, (*b*) in respect of the separate movements of the parts of the moving body.

4. 235 a13–b5. The time, the movement, the body's being moved, the moving body, and the distance it moves, all have corresponding divisions.

5. 235 b6–32. Anything that has changed is, as soon as it has changed, in that into which it has changed.

5. 235 b32–236 a7. The exact time of a thing's having changed is indivisible (i.e. a moment).

5. 236 a7–b18. There is an exact time of a thing's having changed, but none at which it begins to change.

6. 236 b19–32. A thing changes in every part of the exact time of its changing.

6. 236 b32–237 b22. Anything that is changing has already changed, and anything that has changed has already been changing.

Ch. 7. (*a*) Nothing can take an infinite time to perform, or come to rest from, a finite movement.

(*b*) Nothing can perform, or come to rest from, an infinite movement in a finite time.

8. 238 b23–239 a22. (*a*) That which is coming to rest is moving.

(*b*) Coming to rest takes place in time.

(*c*) If we suppose an exact time of a thing's coming to rest, it will be found to be coming to rest in each part of that time.

(*d*) There is no exact time of a thing's coming to rest.

(*e*) There is no exact time of a thing's being at rest.

8. 239 a23–b4. A thing is not, for the exact time of its moving, at any exact place.

(Ch. 9. Solution of Zeno's arguments against motion.)

10. 240 b8–241 a26. That which has no parts cannot be moved.

10. 241 a26–b20. There is no infinite single change except movement in a circle.

THE PRIME MOVER

The contents of Book VIII may similarly be exhibited as a series of propositions :—

Chs. 1, 2. There always has been and always will be motion.

Ch. 3. There are things which are sometimes in motion, sometimes at rest.

Ch. 4. Whatever is moved is moved by something.

5. 256 [a]4–257 [a]31. The first mover is not moved by anything other than itself.

5. 257 [a]31–258 [b]9. The first mover is unmoved.

6. 258 [b]10–259 [a]20. The first mover is eternal and single.

6. 259 [a]20–[b]31. The first mover is not moved even incidentally.

6. 259 [b]32–260 [a]19. The *primum mobile* is eternal.

7. 260 [a]20–261 [a]28. Locomotion is the primary kind of movement.

7. 261 [a]28–[b]26. No motion (or change) is continuous except locomotion.

8. 261 [b]27–265 [a]12. Only circular movement can be continuous and infinite.

Ch. 9. Circular movement is the primary kind of locomotion.

Ch. 10. The first mover has no parts or magnitude, and is at the circumference of the world.

That the first mover is at the circumference of the world follows for Aristotle from (*a*) the assumption that movement must originate either from the centre or from the circumference, these being the only 'beginnings'; (*b*) the assumption that the movement directly imparted by the first mover must be the fastest of all movements, since the impetus must die away in course of transmission; and (*c*) the (supposedly) observed fact that the movement of the sphere of the fixed stars is the fastest of all movements. We thus get the view that all the movement in the world is transmitted from the 'first (i.e. outermost) heaven,' and that the first mover, since it acts directly on this body, must be at the outside of the universe. Aristotle attempts elsewhere [1] to give concreteness to this bold generalisation by showing how the heavenly bodies (and in particular the sun) by their movement produce the meteorological phenomena which form the setting of earthly life, and by means of the rhythm of day and night, of seed-time and harvest, give to terrestrial events their general shape and character. But the conclusion of the *Physics* leaves us with two unanswered problems. (1) How can the incorporeal and unextended first mover nevertheless be at the circumference of the universe? And (2) how can an incorporeal being impart movement? The two modes of imparting movement which

[1] *De Caelo*, II. 3; *De Gen. et Corr.* II. 10; *Meteor.* I–III *passim.*

Aristotle in the last resort recognises are pushing and pulling,[1] and what is incorporeal cannot be credited with either of these. To these questions he attempts an answer in the *Metaphysics*.[2] The first mover is described as causing motion 'as an object of desire' or of love, i.e. as not a physical agent at all, and hence need no longer be viewed as having a local habitation.[3] But this solution raises difficulties no less than those which it removes.

De Caelo

In passing from the *Physics* to the *De Caelo* we pass from a study of change in general to a study of local movement. The first two books deal with the movement of the heavenly bodies, the latter two with that of terrestrial bodies.

In one of his boldest essays in *a priori* construction, Aristotle attempts to show why the general structure of the universe must be such as it is.[4] The activity of God is eternal life. Therefore the movement of the heaven, which is a divine body, must be eternal, and for this reason the heaven must be a rotating sphere. But the centre of a rotating body is at rest. There must therefore be an earth at rest at the centre of the universe. Since there is earth there must also be fire; for fire (that which moves up) is the contrary of earth (that which moves down) and is, besides, prior in nature to it, heat being the form of which coldness is the privation. Since there are fire and earth there must also be the intermediates air and water. The existence of these involves coming into being and passing away, since the contraries present in the intermediates tend to destroy each other. But the existence of coming into being involves a circular movement other than that of the first sphere; for 'a single movement of the whole heaven would necessitate an identical relation of the elements of bodies to one another.' I.e., if the sun and moon were carried round by the first heaven, then 'if the sun were set in Cancer we should have perpetual summer, and if it were set in Capricorn, perpetual winter,'[5] and the changing influences

[1] VII. 2, where 'throwing' is treated as a mode of pushing, 'carrying' as incidental to being pushed, pulled, or rotated, and rotating as a combination of pushing and pulling.

[2] *Λ*. 7.

[3] Cf. *De Caelo*, 279 a18–22.

[4] *De Caelo*, II. 3.

[5] Simplicius, *in loc.*

of heat and cold which are the actual causes of generation and destruction would be absent.[1]

Aristotle's astronomical system is, briefly, as follows :—The heavenly bodies consist of the fifth element, free from generation and destruction, from change of quality or size, and moving not like the terrestrial elements in straight lines but in a circle.[2] The universe consists of a series of concentric spheres. The earth is a sphere of no great relative size,[3] at rest at the centre of the universe.[4] The outer shell of the universe—the 'first heaven'—is a finite sphere containing what we now call the fixed stars.[5] These stars have no motion of their own but are carried round by the uniform rotation of the first heaven once in twenty-four hours.[6] With regard to the more complex movements of the sun, the moon, and the planets Aristotle adopts with a modification the theory of Eudoxus as it had been developed by his own friend Callippus.[7] Eudoxus had by an amazing mathematical feat succeeded in decomposing the apparent motion of the sun and moon into three rotatory movements. Suppose, he said, a sphere rotating uniformly, and having fixed in its surface the poles of a smaller concentric rotating sphere (these being different from its own poles). Suppose a third sphere related to the second as the second is to the first. A body on the equator of the third sphere will have a motion which is the compound of the three rotations ; and by assigning certain speeds and directions to the three rotations you can get a compound motion which answers to the observed motion of the sun and moon. Similarly the motion of each of the planets may be decomposed into four rotations.[8]

[1] In II. 12 Aristotle gives a similar *a priori* account of why the movements of the planetary spheres must be such as they are.

[2] I. 2, 3.

[3] Aristotle mentions with approval (298 ᵃ15) an estimate of its circumference at about 46,000 miles—not quite twice its actual length. Aristotle's opinion, expressed in this connexion (298 ᵃ9–15) that there may be no great distance between Spain and India by the western ocean was one of the chief causes which sent Columbus on his voyage of discovery, so that the names 'West Indies' and 'Red Indian' are indirectly due to Aristotle.

[4] II. 13, 14. Aristotle states correctly some of the main evidence for the sphericity of the earth, and grasps the principle that its shape is due to the movement of its parts towards its centre. Cf. his proof that the surface of water is spherical, II. 4.

[5] I. 5, II. 4 [6] II. 6, 8. [7] *Met.* Λ. 8.

[8] For the details see Heath, *Aristarchus of Samos*, ch. 16 ; Dreyer, *Planetary Systems*, ch. 4.

Callippus, with more accurate observations before him, found it necessary to suppose five spheres to account for the motions of the moon, the sun, Mercury, Venus, and Mars. In the hands of Eudoxus and Callippus the theory seems to have been a purely mathematical one ; they made no suggestion as to the mechanism which accounts for the motion of the heavenly bodies. Further, the motion of each of these bodies (except the 'fixed' stars) was treated as a separate problem. But Aristotle finds in the suggestion of concentric rotating spheres something that fits into his general system of thought, and adopts it as being the actual mechanism of the heavens. So taking it, he finds a difficulty in it. If the whole universe is a system of concentric spheres in contact (and they must be in contact, since there is no void), the sphere which carries one heavenly body will carry round with it the outermost sphere of the system of the next body (counting inwards) and will interfere with the self-contained explanation which Eudoxus' theory gives of the motion of each body. To prevent this Aristotle assigns reagent spheres moving in directions contrary to those of the original spheres and allowing only the movement of the *outermost* sphere of each system (the daily rotation from east to west) to be carried through to the system inside it. He thus gets 55 spheres in all. If we add four for fire, air, water, and earth, we get a universe consisting of 59 concentric spheres.[1] Aristotle is often charged with having misunderstood Eudoxus' theory ; but he can hardly be blamed for trying to give a mechanical explanation of the movement of the heavenly bodies, nor for basing it on the best available mathematical theory.

The movement of the first heaven is due to the action of God, operating as an object of love and desire. For Aristotle space is finite ; there is no void ; uniform movement must be either in a straight line or circular ; and the uniform rotation of a sphere is the only movement which can go on eternally without change of direction and without requiring either a void or infinite space. Thus Aristotle is enabled to deduce the existence of the celestial sphere, and to explain its rotation as the

[1] But the last four are somewhat ideal, since there is constant transformation going on between the four elements, and a portion of one element produced by transformation from another does not, as it were, get home immediately. In particular, Aristotle denies the existence of definite spheres of fire and air. Fire merely predominates in the upper part of the atmosphere, air in the lower.

nearest approximation possible for a corporeal thing to the eternal unchanging activity of the divine self-knowledge. But the proper motions of the sun, moon, and planets involve spheres rotating in directions different from that of the first heaven, and this movement he explains by the action not of God but of a separate motive agent for each sphere—the 'intelligences' of the schoolmen.[1] He certainly means to reach a monistic system; he adopts as his own the Homeric maxim 'the rule of many is not good; one ruler let there be.'[2] The intelligences must be inferior to the prime mover, but their actual relation to God is left quite obscure, as is also their mode of operation on the spheres. As they are incorporeal beings, presumably they too act not as physical agents but as objects of desire.

To the sublunary portion of his system Aristotle turns in Books III. and IV. His subject here is the four elements considered in respect of their heaviness and lightness, i.e. their tendencies to locomotion. The *De Generatione* will consider them in regard to their powers of acting on one another and of thereby producing the other three kinds of change—generation, change of quality, change of size.[3] Aristotle is concerned to maintain the existence of absolute weight and lightness, i.e. of a tendency in some bodies to move towards the centre, and in others to move towards the circumference, of the universe. The bases of his theory are (1) the fact that matter of certain kinds tends to rise (or fall) in matter of certain other kinds irrespective of their comparative bulk, and on the other hand (2) the supposed empirical fact that a greater quantity of matter of a particular type exhibits the character of the type more fully than a small quantity, is heavier if the type be heavy, lighter if it be light.[4] One theory had maintained that a heavy body simply contains a greater number of similar parts than a light body. But if this were so, Aristotle argues, a greater quantity of fire should rise more slowly than a smaller, whereas in fact it rises more quickly; and again a sufficiently large quantity of air should be heavier than water, but in fact air always rises in water. Another theory had accounted for the fact that bulk and weight do not always correspond, by the presence of *void* in light bodies. But then a sufficiently small quantity of a heavy type of body would

[1] *Met.* 1073 ᵃ26–ᵇ1; *De Caelo* 279 ᵃ18–22. [2] *Met.* 1076 ᵃ4.

[3] There is a shorter discussion of generation in *De Caelo*, III.

[4] IV 2.

be lighter than a sufficiently large quantity of a lighter type of body—which is not the case. Nor will it do to make weight depend on the ratio between the solid and the void in a body; for then a small portion of fire should move as fast as a large. The only solution, Aristotle holds, is to recognise that there are qualitatively different kinds of matter. If there is only a single matter, nothing can be *absolutely* heavy or light. Again, if there is only one matter and its contrary, no reason can be given for the *relative* lightness and heaviness of air and water.

The fact is that the rising of fire, the sinking of earth are similar to the natural tendency of things to develop a certain substantial nature or certain qualities or to grow to a certain size.[1] 'Motion of a body to its own place is motion to its own form.' It is the very nature of earth to be at the centre of the universe, and therefore it cannot rest till it is there—or as nearly there as other portions of earth will allow it to get. To ask why fire moves upwards is like asking why the curable, when acted upon qua curable, attains health and not whiteness. But there is a difference; the tendency to rise or fall seems more internal to its possessor, less dependent on external agency, than the tendency to qualitative or quantitative change; and the reason is that the matter or potentiality for locomotion is 'nearest to substance'; it is the latest to be generated of the tendencies to change (as we can see in the young of animals), and that shows that it is first in order of being—more than the other tendencies an integral part of its possessor's nature. Thus 'whenever air comes into being out of water, light out of heavy, it goes to the upper place. It is forthwith light; becoming is at an end, and in that place it has being.' The rising and falling of bodies is simply the actualisation of potentiality. The intermediates air and water have a double potentiality; as the same body is potentially well and sick, air tends to rise in earth or water but to sink below fire, water to rise in earth but to sink below fire or air.[2]

De Generatione et Corruptione

Aristotle recognises two main earlier views with respect to coming into being and passing away.[3] The monists are bound to reduce these processes to qualitative change of a single substance; the pluralists are bound to recognise them as

[1] IV. 3. [2] 312 a17–21. [3] I. 1.

different from change of quality, but they explain generation as the association of different elementary bodies to form an aggregate, and destruction as their dissociation.

The Atomists gave a more definite form to this theory by explaining coming into being and passing away by the association and dissociation of *atoms*.[1] The argument which seems to justify the belief in atoms is the following :—' If we suppose a body to be divisible through and through, it might be at one moment in a state of through and through division, i.e. have been divided into parts without magnitude. But no number of such parts can make an extended body. Therefore body cannot be divisible through and through; there must be indivisible bodies.' Yet the belief in atoms leads to impossible consequences which Aristotle has detailed elsewhere.[2] He mediates between the opposing views by insisting that a body can be divided anywhere, but not everywhere at once It can be divided anywhere; there is no part of it which resists division, in the manner of the supposed atoms. But it cannot be divided everywhere at once, for that would mean that it has a finite number of points such that point could be next to point and the body could be divided at all these points and dissolved away into nothing; whereas it has potentially an infinite number of points, none next to another.

There is, then, no dissociation of a thing into atoms, but only into relatively small parts. But dissociation and association, even when so restated, will not account for the change of a thing ' from this to that, as a whole,' change affecting not only a thing's qualities but the formal and the material factor which together make it what it is.

There are two difficulties, Aristotle points out, with regard to ' unqualified coming to be,' the coming to be of a substance, in distinction from the assumption of a new quality by a substance.[3] (1) How can substance come to be? It must come, apparently, from what is only potentially substance; now if we suppose that this potential substance has *no* attributes actually, we are supposing the separate existence of a being which is quite indeterminate, and are also forgetting the maxim ' nothing comes out of nothing '; while if we suppose that it actually has non-substantial attributes, we are making the impossible supposition that properties can exist apart from

[1] I. 2. [2] *Phys.* 231 a21 ff.; *De Caelo*, 303 a3 ff.

[3] I. 3. Two other senses of the distinction between qualified and unqualified coming to be are pointed out in 318 a31–35.

substances. (2) What is the cause of the perpetuity of coming to be? The efficient cause has been assigned in the *Physics* [1]; it is the prime mover and the *primum mobile.* We are now concerned with the material cause.

The answer to both our questions lies in this—that the destruction of one substance is the generation of another, and *vice versa.* I.e., the material cause of generation-destruction and of its perpetuity is matter which can assume first one and then another substantial form. Generation seemed puzzling because it seemed to be coming to be out of what sheerly is not, but we now see that it is not this. The perpetuity of generation seemed puzzling because the sum of existence seemed to be constantly wasting away by the passing of things into nothing; but we now see that passing away is not that—what is imperceptible to sense is not necessarily nothing. Generation and destruction are the two sides of a single transformation of substance into substance. Yet of such transformations some are more properly called cases of coming to be, viz. those in which the substance produced has a higher reality, a more positive character, than the other; thus the production of fire from earth is unqualified coming to be and can only with a qualification be called passing away, since heat is the form of which cold is the mere privation,

Aristotle proceeds to distinguish more definitely the kinds of change.[2] *Alteration* is the kind which takes place when (*a*) there is a perceptible persistent substratum and (*b*) the new quality is a quality of the persistent substratum. Both conditions serve to mark off alteration from coming into being, for (*a*) in all coming into being there is a persistent substratum but one which is imperceptible, viz. 'prime matter,' and (*b*) in some coming into being a perceptible quality persists (e.g. transparence, in the generation of water from air), but the new quality (e.g. coldness) is not a quality of this but a fellow-quality with it.

Elsewhere [3] Aristotle insists that alteration is always change in respect of the third of the four kinds of quality recognised in the *Categories* [4]—'state and disposition,' 'natural powers and impotencies,' 'affective qualities and affections' (i.e. the qualities perceived by the special senses), 'figure and shape'; but here alteration is treated as including at all events change in respect of the first and fourth kind as well.[5]

[1] 258 ᵇ10 ff. [2] I. 4. [3] *Phys.* 245 ᵇ3 ff.
[4] 8 ᵇ25–10 ᵃ26. [5] 319 ᵇ12–14.

Matter in the most proper sense is the substratum involved in substantial change; but the substrata involved in locomotion, in alteration, and in change of size are in a certain sense also matter.

Growth differs from generation-destruction and alteration (1) in being change in respect of size, not of substance or quality, and (2) in involving change of place; the change of place it involves is of a special type, neither translation nor rotation but expansion.[1] To consider the first point further, growth is not the emergence of magnitude out of what is not magnitude. The matter presupposed by it is not separable but only distinguishable from that presupposed by generation or by alteration. What it presupposes is a sensible body, and every sensible body is an indivisible whole of substance, quality, and size; but what thought distinguishes as the matter of growth is the *size* of the pre-existing body.

Certain principles may be laid down which must guide our account of growth. (1) In growth every part of the growing thing increases. (2) A growing thing grows by the accession of something. This something must be body since there is no such thing as a separate void; but its being body seems to involve the paradox of two bodies being in the same place. (3) To distinguish growth from a coming to be which is accompanied by expansion (e.g. that of air from water), we must add that in growth the growing thing persists in its own nature.

Growth in its proper sense is a property of living things, and if we wish to grasp its cause we must note that (1) it is primarily the tissues that grow (the organs being built up by them), and (2) the tissues have both a matter and a form or plan of structure. Not every part of the tissue *qua* matter grows, for its material particles are ever flowing in and flowing out again; what remains the same and yet expands is its form or structure. The efficient cause of growth is the nutritive soul, which by mixing the food, which is potentially flesh, with the flesh of the body, turns it into actual flesh. The form whose expansion is growth is 'a kind of power immersed in matter—a duct, as it were' into which new matter flows. So long as this power can absorb more matter than is needed to repair the waste of the tissue, growth proceeds; but when the power becomes weakened by use, though nutrition continues growth ceases and in time decay begins.

Having distinguished generation from alteration and growth,

[1] I. 5.

Aristotle turns to discuss its causes, and first its material cause —not its logically distinguishable ultimate substratum, prime matter, but the 'so-called elements,' the sensible bodies which are the materials of the tissues whose generation he is to explain.[1] They constitute these tissues by chemical *combination*; combination implies *action and passion*; action and passion involve *contact*. These three things must therefore be considered.

(1) Two things, as we have seen, are in *contact* when they 'have their extremes together.'[2] But contact in the strictest sense belongs only to things which have position and place, i.e. (since 'above' and 'below' are the primary differentiations of place) to things which naturally move up or down. Now bodies which are heavy or light are such as to act and be acted on. In other words, contact belongs properly only to sublunary, changeable bodies. But in a secondary sense it belongs (*a*) to mathematical objects, which may in a sense be said to have place,[3] and (*b*) to anything (Aristotle is probably thinking of the relation between the outer heaven and the celestial sphere next it) which moves without being reciprocally moved, and without acting or being acted on, i.e. without causing or suffering *qualitative* change. Such a body will touch without being touched, but in the sublunary world contact is reciprocal.

(2) Aristotle's predecessors had maintained either that only unlike acts on unlike or that only like acts on like.[4] But a thing can produce no change in what is exactly like it; nor can it act on what has nothing in common with it—a line cannot as such act on whiteness. *Patient and agent* must be the same in genus and different in species; i.e. they must be either contraries or their intermediates. This being so, since coming to be is a process into a contrary state it *must* take the form which we see it take—that of assimilation of the patient to the agent. Now we sometimes speak of the substratum, sometimes of one contrary, as being acted on (e.g. 'the man is being warmed,' 'what is cold is being warmed'). The advocates of the one view were concentrating their attention on the substratum, those of the other on the contraries.

As between things of the same kind, action involves reaction. For such things have the same matter or potentiality of

[1] I. 6. [2] *Phys.* 226 b23.

[3] Aristotle does not say how, but he presumably means 'in the sense that the sensible things from which they are abstracted have place,' or that, as they have νοητὴ ὕλη, so they are located by thought in imaginary space. [4] I. 7.

opposites. The agent A and the patient B are really x-a and x-b, and x-a, which imparts a-ness to x-b, is itself capable of being x-b and must become so when in contact with x-b. But on the other hand *first* agents, ' active powers whose forms are not embodied in matter ' (Aristotle seems to mean the arts and crafts and to be distinguishing intelligent from physical action) need not in acting be acted on. Food in curing a patient is itself acted on by his digestion ; the art of healing heals without being acted on.

After discussing two celebrated theories of action-passion—the ' pore ' theory of Empedocles and the ' atoms and void ' theory of Leucippus and Democritus [1]—Aristotle insists that bodies are susceptible to change not in particular parts where there are pores or voids, but through and through, though there may be veins of greater susceptibility running through them.[2]

(3) The possibility of *combination* had been denied by some thinkers on the ground that if (a) both constituents persist unaltered or (b) only one is destroyed, they cannot be said to be combined, while if (c) both have been destroyed, *they* do not exist combined since they do not exist at all.[3] Aristotle answers that in combination none of these alternatives is realised. Wood does not *combine* with fire, nor food with the body, nor the shape with the wax, nor whiteness with knowledge. The solution lies in recognising that the constituents neither persist quite as they were nor are completely destroyed ; in the combination they are still potentially what they were before, and they can by analysis be made again what they were.

Combination is, Aristotle proceeds, not to be interpreted as the juxtaposition of parts of the one constituent with parts of the other—either (a) of parts so small as to be imperceptible, or (b) of atomic parts. There are no atoms, and neither view will account for the production of a genuine homogeneous body in which every part is exactly like the whole and every other part. The product of combination must be no mosaic, however small the stones of the mosaic be supposed to be.[4] The things which are to be combined must be (a) such as to act on each other, (b) easily divisible (i.e. liquids), and (c) present in fairly well-balanced amounts. When these conditions are present each will modify the other to a nature intermediate between their original natures, and this alteration is the cause of combination.

[1] I. 8. [2] I. 9. [3] I. 10. [4] The phrase is Prof. Joachim's.

It will be seen that combination, in Aristotle's conception of it, is thorough chemical union as opposed to mechanical mixture; but he goes further than modern chemistry, which supposes *atoms* to persist unchanged, whatever unions they enter into.

Aristotle returns now to the material cause of generation, the 'so-called elements.'[1] His first question is whether they are really elements, ultimate unanalysable entities; his second whether any of them is prior to all the rest. (1) His answer to the first question is that there is not, as some thinkers had supposed, any body prior to them. A common substratum for them, prime matter, is implied, but this has no separate existence; it exists only as qualified by one or other of certain contrary qualities, which in their turn exist only in this substratum. Contraries (or form and privation) and substratum are logically distinguishable but inseparable elements in fire, air, water, and earth, which, though not strictly elements since they are logically analysable, are the simplest of sensible bodies.

These primary contraries must be tangible qualities, since tangible qualities are the only qualities common to all perceptible things.[2] Of tangible qualities some, such as heavy-light or hard-soft, do not imply power to act or to be acted on. But the elements must act and react on each other, since they combine with and are transformed into each other. They must therefore be characterised by the qualities hot and cold, and dry and fluid. Not only does hot temper cold, dry fluid, and *vice versa*, but hot-cold play in general the part of agent and dry-fluid that of patient. Hot associates things of the same kind and dissociates things of different kinds, while cold associates homogeneous and heterogeneous things alike. The active part played by heat and cold in the construction of inanimate things is examined in detail in the fourth book of the *Meteorologica*; and the biological works are full of allusions to the action of the 'inborn heat' in maintaining the processes of life.[3] Digestion, for example, is consistently described as a species of cooking. Here Aristotle contents himself by showing

[1] II. 1. [2] II. 2.

[3] On the large part played in Aristotle's physiological theory by the *σύμφυτον θερμόν* or *πνεῦμα*, and on Aristotle's connexion with earlier and later pneumatic theories, cf. G. L. Duprat in *Arch. f. Gesch. d. Phil.* XII. 305–321. Duprat thinks that Empedocles and Hippocrates exercised the greatest influence on Aristotle in this respect.

how the minor tangible qualities are derived from the four major qualities.

The four primary qualities taken in couples would yield six combinations.[1] But the contraries hot and cold, and again dry and fluid, refuse to be coupled. There are therefore four combinations, which Aristotle assigns as follows :—

Hot and dry to fire,
Hot and fluid to air,
Cold and fluid to water,
Cold and dry to earth.

Or rather, these combinations are assigned to the simple bodies of which what we call fire, air, water, and earth are impure or exaggerated forms ; what we call fire is, for example, excess of heat, just as ice is of cold. Further, in each of the four bodies one quality predominates—dryness in earth, cold in water, fluidity in air, heat in fire.

(2) Aristotle passes to his second main question about the elements.[2] None of the four is primary, underivative, unchangeable ; all alike pass into one another in a cycle. (*a*) The quickest transformation is that of an element into one which stands next it in the above series, so that change in only one primary quality is involved. (*b*) The hardest transformation is that in which a step is skipped, so that change in both qualities is involved. (*c*) A third method is that in which two elements taken together pass into a third by each dropping one quality. Thus fire + water can produce either earth or air. But the elements combined must not be consecutive, for then the dropping of one quality by each would leave either two identical or two contrary qualities.

Next Aristotle points out the difficulties in which Empedocles is involved through maintaining the four elements to be incapable of transformation,[3] and shows how his own distinction of the absolutely and the relatively hot, cold, dry, and fluid, and his recognition of the reciprocal action of contraries, allow him to explain the combination of the elements into homoeomerous bodies.[4]

All the homoeomerous bodies must contain earth, since earth predominates in the sublunary region in which alone they are found.[5] All must contain water, since compounds must have a definite outline and water alone of the elements is readily adaptable in shape, and since (further) earth cannot cohere without moisture. Observation actually shows that all living

[1] II. 3. [2] II. 4, 5. [3] II. 6. [4] II. 7. [5] II. 8.

things must have both earth and water to nourish them. And since compounds are made out of contraries, they must contain air and fire, the respective contraries of earth and water.

Aristotle now proceeds to sum up his account of the causes of generation.[1] The material cause—that which makes generation *possible*—is 'that which can be and not be,' i.e. transient mutable substance. The formal and at the same time the final cause is 'the formula expressing the essential nature' of the things that come to be. I.e., a formula which states the ratio of the elements in a compound will serve both to define it and to indicate the end at which its formation aims. But not only is the structure of the complex body an end in itself; the continuity of coming to be, since it gives to sublunary things the only eternity which, owing to their distance from the mainspring of the universe, they can have (i.e. the eternity of species), adds to the perfection of the universe, which is the true final end.[2]

But a material and a formal cause are not enough. Eternal Platonic Forms operating on eternal participants will not account for generation taking place *now* and not *then*. Nor will it do to ascribe the process to matter alone. It is characteristic of matter to be moved; to move belongs to a different power, whether we have regard to things made by art or by nature. Water does not of itself produce an animal, nor wood a bed. It is true that the hot dissociates and the cold brings together, but they do this only when acting as instruments of form. To ascribe generation to the properties of matter alone is like treating the saw as the whole cause of the carpenter's products; it is a necessary but not a sufficient condition.

Aristotle's own account of the efficient cause is as follows.[3] He has elsewhere[4] shown that the heavenly bodies are in eternal motion. This causes the sun to approach and retire from any given point on the earth alternately and thus produces perpetual generation. It is more reasonable to describe generation, the coming to be of what is not, as due to the local movement of what is, than to describe local movement as due to generation. But a single motion will not account for the *two* processes of generation and destruction. There must be two motions contrasted either by their direction or by their difference of speed. These are in fact the two halves of the motion of the sun along the ecliptic, in which it successively

[1] II. 9. [2] 336 b26–34. [3] II. 10. [4] *Phys.* VIII. 7–9.

approaches and recedes from any given point on the earth and thereby causes generation and destruction—the growth of plants, the development and decay of animals, the seasonal alternations of heat and drought with cold and rain.[1] As by successive approaches the sun causes animals and plants to develop to maturity, by successive retreats it produces their decay. By its movements a limit is set to the normal life of each species, a limit which they do not always reach because of accidental variations in their constitution.

The perpetual transformation of the elements into one another produced by the sun's approach and retreat explains—what had been found a puzzling problem—how it is that the four elements have not permanently taken up their abode in the four concentric spheres to which they belong and towards which they always move. It is the sun's movement that produces interchange of element with element and thus holds the sublunary world together. And finally, since time is continuous and is the measurable extensity of movement, it implies a continuous, and therefore a circular, movement, so that the movement of the celestial spheres is what makes time itself continuous.

METEOROLOGICA

Different views have been taken by commentators of the precise way in which the *Meteorologica* fits into the scheme of Aristotle's physical works. The Greek commentators and St. Thomas divided the attributes of the elements into

(1) Those natural to the elements (*a*) as natural bodies, i.e. the qualities connected with movement in space, viz. weight and lightness; (*b*) as the matter out of which compounds are made, i.e. the qualities connected with qualitative change, viz. heat and cold, dryness and fluidity.

(2) Those generated by an external agent.

They held that while the *De Caelo* deals with (1*a*) and the *De Generatione* with (1*b*), the *Meteorologica* deals with (2). Zabarella on the other hand holds that, the nature and conditions of mixture or combination having been discussed in the *De Generatione*, the object of the *Meteorologica* is to study (1) imperfect (and therefore transient) mixtures, i.e. those which either do not contain all the four elements or contain them imperfectly combined (Books I.–III.), and (2) the inanimate

[1] Cf. *Meteor.* I. 9.

perfect mixtures, while the biological works proceed to animate perfect mixtures, i.e. tissues and the organs and living creatures composed of them. It may be doubted whether Aristotle thought of the subject quite in either of these ways. The work announces itself as his contribution to the already recognised science of meteorology, the study of 'things on high.' Its subject is in the main weather phenomena such as wind and rain, thunder and lightning, together with certain astronomical phenomena (such as comets and the milky way) which Aristotle wrongly believed to be not astronomical but meteorological. But the fourth book deals with quite a different set of facts—with composite bodies such as the metals, and their sensible qualities. In one respect Aristotle narrowed the scope previously given to meteorology, by distinguishing astronomy from it ; in another respect he widened its scope, by including the study of terrestrial substances.[1] In his hands it becomes a study of the combinations and mutual influences of the four elements.

The efficient cause, Aristotle reminds us, of the phenomena to be considered is the influence of the heavenly bodies ; and among these an overwhelmingly important part is, as is proper, assigned to the sun. The material causes are fire, air, earth, and water.[2] The first problem that Aristotle raises[3] is, What is it that fills the region which is the scene of weather phenomena, the region between the earth and the moon ? His account of this region turns on the doctrine, Heraclitean in its origin, that there are two 'exhalations' produced by the sun's rays acting on the surface of the earth. When the sun's rays fall on dry land, they draw up from it an exhalation which is hot and dry, and which Aristotle likens for the most part to smoke but also to fire and to wind. When they fall upon water, they draw up an exhalation which like water is moist and cold, and is called the vaporous in opposition to the smoky exhalation. The dry exhalation consists of minute particles of earth on the way to being fire, and exhibiting already, though in a weaker degree, the properties of fire—heat and dryness. The moist exhalation consists of minute particles of water on the way to becoming air, but exhibiting in the main the qualities of water—coldness and moisture.[4] The upper part of the

[1] i.e., if Bk. IV be genuine. [2] 339 a27–32. [3] I. 3.

[4] The general nature of the exhalations is indicated in 340 b23–29, 341 b6–22, 359 b28–360 a27. In 340 b27 the received text describes the moist exhalation as *hot*, and the same view is implied in *De Gen. et*

atmosphere contains only the dry exhalation; the lower part contains both exhalations and exhibits the heat of the one and the moisture of the other. These two parts of the atmosphere are what are called fire and air respectively. But the upper part is not strictly fire (i.e. flame, which is a sort of 'excess of heat, or boiling'), but a tinder-like substance which movement easily sets on fire.[1] Neither exhalation, it should be noted, ever exists quite without the other; but one or other may definitely predominate. Since these two exhalations are what fills the whole region between the earth and the moon, they are evidently the matter of all meteorological phenomena. The first three books of the *Meteorologica* consist of a series of ingenious attempts to show how the two exhalations under the influence of heat, cold, or movement will exhibit various phenomena and take various forms. Aristotle discusses first the phenomena which take place in the upper or fiery region—shooting stars, aurora and cloud coloration, comets, the milky way.[2] He then passes to the lower or aerial region, and explains the effects produced in it by the moist exhalation—rain, cloud, and mist, dew and hoar-frost, snow and hail.[3] From these he proceeds to phenomena on or below the surface of the earth. Of these he discusses first those which are due to the moist exhalation—rivers, springs, floods, the sea.[4] He then proceeds to events in the aerial and terrestrial region due to the dry exhalation—winds, earthquakes, thunder and lightning, storm-winds and thunderbolts,[5] and returns to a special group of phenomena due to the moist exhalation, viz. those in which reflection or refraction is involved—halos, rainbows, and mock suns.[6] Throughout there is evidence of a very considerable amount of close observation, rendered to a large extent nugatory by *a priori* theorising. The account of rainbows is the most interesting, and rightly treats them as an effect of refraction.

Aristotle turns next to the effects produced by the exhalations

Corr. 330 b4. But in 360 a23, 367 a34, it is described as *cold*, and the logic of the passage 340 b23–29 requires us to read ψυχρόν in l. 27, where it is actually found in two good MSS. Aristotle thinks of the moist exhalation in fact as intermediate in heat between water and air (347 a24), and emphasises now its affinity to the one, now its affinity to the other.

[1] 341 b19. [2] I. 4–8. [3] I. 9–12.

[4] I. 13–II. 3. Incidentally I. 13 gives a fascinating outline of the geographical ideas of the time.

[5] II. 4–III. 1. [6] III. 2–6. 378 a14.

when 'imprisoned' in the earth, i.e. the minerals. These are divided into the metals, which are formed by the moist exhalation, and the 'fossiles,' formed by the dry; most of the latter are said to be either 'coloured powders' or stones formed out of such.[1]

Book IV considers in detail the operation of the active qualities heat and cold and the modifications of the passive qualities dryness and fluidity.[2] The primary effect of heat and cold is the generation, by their presence in due proportion, of a *new substance* from given material. The opposite of generation is putrefaction, which is due to cold in the putrefying thing itself and to heat outside it.[3] The effect of heat on *already existing substances* is described under the general name of concoction, which includes three types—ripening, boiling, roasting, the latter two names being transferred from operations of art to kindred operations of nature; digestion, for instance, is described as a kind of boiling process.[4] From this subject Aristotle passes to characteristics and phenomena connected rather with the passive qualities—hardness and softness, drying and moistening, solidification and liquefaction, softening and thickening.[5] The qualities of composite bodies, whether animate or inanimate, are divided into those which imply a power of acting on the senses—the 'special sensibles' of the *De Anima*—and those which imply ability or inability to be acted on; and eighteen pairs of qualities of the latter type—soluble, insoluble, bendable, unbendable, etc.—are discussed and defined.[6] Finally, homoeomerous bodies are classified according to the predominance in them of earth or water and according to their specific temperature;[7] but it is pointed out that tissues, no less than organs, though less obviously, are what they are by virtue not merely of having certain material qualities but also of performing a certain function in the organism.[8] The way is thus prepared for the teleological treatment of the living body in the *De Partibus Animalium*, which is evidently meant to be studied next.

[1] 378 ^{a}15–^{b}6.
[2] 378 ^{b}26–28.
[3] IV. 1.
[4] IV. 2, 3.
[5] IV. 4–7.
[6] IV. 8, 9.
[7] IV. 10, 11.
[8] IV. 12.

CHAPTER IV

BIOLOGY

FROM Aristotle's point of view, biology and psychology are not two separate sciences. His psychological and biological works form a single group, which he might perhaps have divided as follows. The *Historia Animalium* is a preliminary work which aims at recording the main facts of animal life. The remaining treatises aim at eliciting theory from the recorded facts. The theory deals partly with the matter of living things (*De Partibus Animalium, De Incessu Animalium*), partly with their essential form (*De Anima*), partly with their consequential properties (*Parva Naturalia, De Motū Animalium, De Generatione Animalium*). But in view of the subsequent development of the sciences it will be convenient to treat his biology and his psychology separately.

It was natural that Aristotle, brought up as he was in a medical family, should be interested in biology, and his works show that this was in fact one of his chief interests. In the mathematical sciences he was abreast of the knowledge of his time; but he did not, so far as we know, make original discoveries in mathematics. In biology, on the other hand, whether we have regard to his powers of observation, his collation of the evidence of other observers, or his theoretical discussions, he was far ahead of his time; he was, indeed, the greatest of ancient biologists, and the greatest of modern biologists could say of him 'Linnæus and Cuvier have been my two gods, though in very different ways, but they were mere schoolboys to old Aristotle.'[1]

Aristotle mentions some five hundred different animals, a large number relatively to the knowledge of the time. But his references are of very unequal value. Many of them are mere allusions without any detail; many are mere repetitions

[1] Darwin's *Life and Letters*, III. 252.

(often with an expressed reserve)[1] of travellers' tales or of legendary lore.[2] But many of them show an accuracy and a minuteness which imply close personal observation. He may have learnt the art of dissection from his father, and he seems to have dissected some fifty different kinds of animal.[3] He probably never dissected a human body,[4] but did to some extent dissect the human embryo.[5] Where he had no direct knowledge, he got his information wherever he could—from herdsmen, hunters, bird-catchers, apothecaries, and above all from the fishermen of the Aegean.[6] His local references are chiefly to two regions which were well known to him personally—to Macedonia and Thrace, and to the Troad and the adjacent islands;[7] he refers less often to the other districts where he spent parts of his life, the neighbourhoods of Athens and of Chalcis.

Many of Aristotle's observations have moved the admiration of later investigators. He recognised, for example, the mammalian character of the cetaceans[8]—a fact which was overlooked by all other writers till the sixteenth century. He distinguished the cartilaginous from the bony fishes, and described them with marvellous accuracy.[9] He describes carefully the development of the embryo chicken, and detected on the fourth day after the laying of the egg the presence of the heart 'like a speck of blood in the white of the egg, beating and moving as though endowed with life.'[10] He gives an excellent account of the four chambers of the stomach of ruminants.[11] He detected a remarkable feature in the copulation of the

[1] E.g. *H.A.* 501 a25. Cf. criticisms of Herodotus and of Ctesias in 523 a17, 26.

[2] E.g. the amusing account of the "martichoras" or tiger, 501 a25–b1. The spurious books contain much matter of this sort; cf. the accounts of the panther and the bison, 612 a7–15, 630 a18–b17.

[3] List in Lones, *A.'s Researches in Natural Science*, 106.

[4] Cf. his confession of ignorance in *H.A.* 494 b22–24, and indications of ignorance in 491 b1, 494 b33–495 a1, 495 b24–26, 496 a19.

[5] This seems to be implied by such passages as 513 a32 f.; *P.A.* 666 b7 f, 671 b6–9, 676 b31–33.

[6] Cf. *H.A.* 572 a33; 597 b25; 487 b30; 594 a23; 528 a32, 532 b20, 533 b29, 535 a20, 557 a32, 591 a16, 602 b9, 603 a7; *Meteor.* 348 b35; *G.A.* 720 b34, 756 a32.

[7] References to the latter district are especially common in *H.A.* V.

[8] *H.A.* 489 a34–b2, 521 b21–25, 566 b2–17.

[9] 489 a34–b13, VI. 10; *G.A.* 733 a6–17.

[10] *H.A.* VI. 3.

[11] *H.A.* 507 a33–b12; *P.A.* 674 b7–15.

cephalopods, which was not rediscovered till the nineteenth century.[1] His accounts of the fishing-frog and the torpedo are minute,[2] and are in the main confirmed by later observation. His account of the habits (though not of the structure) of bees is excellent.[3] His description of the vascular system of mammals, though containing features which remain obscure, is in the main very good.[4]

The *Scala Naturae*

Not only was Aristotle the first person to whom it occurred to collect the available information about the animal species, but he was also the first to undertake the problem of their classification. He has in the *De Partibus*[5] an interesting discussion of the problem of classification. Plato's method of division by dichotomy is open to three main objections. (1) If, as is proper in division, each differentiation springs out of the previous differentiation ('feathered' animals being divided for instance into those with barbed and those with unbarbed feathers, not into wild and tame), dichotomy implies that each *infima species* is characterised by one differentia alone—the completely determinate form of one determinable. But if so, we shall inevitably break up natural groups the members of which have much more than one attribute in common; we shall for instance classify some birds with land animals and others with water animals. (2) In dichotomy one differentia in each pair is purely negative, and does not admit of further differentiation; 'there are no species of that which is not.' It is only a positive determinable that is susceptible of determination. (3) We shall reach the complete determination of any given determinable too soon; if we confine ourselves at each stage to two alternative forms of one single determinable we shall not have enough differentiae to go round the species that actually exist.

If now, to escape these difficulties, we adopt in the course

[1] *H.A.* V. 6.
[2] 620 ᵇ11–29; *P.A.* 696 ᵃ27–33.
[3] *H.A.* V. 21, 22, VIII. 27, IX. 40.
[4] *H.A.* 513 ᵃ15–515 ᵃ26; *P.A.* III. 4, 5. Good accounts of some of the most remarkable of Aristotle's observations on animals may be seen in Dr. Singer's *Studies in the History and Method of Science*, vol. II., and in Prof. D'Arcy W. Thompson's article on Natural Science in *The Legacy of Greece*.
[5] I. 2–4.

of our division a new *fundamentum divisionis*, dividing feathered animals for instance into wild and tame, we are introducing something quite irrelevant and deserting the principle on which dichotomy is based. Better, then, to introduce more than one differentia from the very start ; to recognise that there are in fact great natural classes, like ' bird ' and ' fish,' marked off from each other by a host of differentiae many of which are equally characteristic.

Aristotle recognises in principle three grades of likeness which are found within the animal kingdom. There is first the complete identity of type which exists within a single species. Differences there are between individuals, but they serve no end and it is no part of the economy of nature to produce or to perpetuate them. There is secondly the likeness between species of the same ' greatest genus ' ; such species have the same bodily parts, differing only in degree—in number, size, softness or hardness, smoothness or roughness, etc. There is thirdly the likeness by analogy between ' greatest genera ' themselves ; for Aristotle grasps firmly the homology between arm, fore-leg, wing, and fin, between bone and fish-spine, between feather and scale.[1]

How does he apply these principles to the actual classification of animals ? No cut-and-dried classification is to be found in his writings. He is well aware of the difficulties ; well aware of the existence of isolated species which fall under no recognised ' greatest genus,' and of species intermediate between two such genera. But his classification is clear enough in its main lines, and it is one which has on the whole stood well the test of time ; it was a great advance on anything that preceded it, and no further advance was made before Linnæus. His widest divisions are the sanguineous and the bloodless animals, answering to the modern ' vertebrates ' and ' invertebrates.' Of the sanguinea the main genera are :—viviparous quadrupeds, cetacea, birds, oviparous quadrupeds and apoda (reptiles and amphibia), fishes.[2] Besides these there are the isolated species man[3] and certain intermediate species. The bloodless animals are divided according to the consistency of their inner and outer parts. There are the malacia (cephalopods), which have a soft outside and their only hard substance inside ; the malacostraca (crustacea), with a harder outside and a soft inside ; the

[1] *H.A.* 486 ^{a}14–^{b}22, 497 ^{b}6–13 ; *P.A.* 644 ^{a}16–23.
[2] *H.A.* I. 6, II. 15 ; *P.A.* IV. 10–13.
[3] *H.A.* 490 ^{b}16–19.

ostracoderma or testacea (molluscs excepting cephalopods), with a still harder outside and a soft inside; and the insects, which (Aristotle is led by his principle of division to say) are hard throughout.[1] There are, besides, exceptional forms, half-animal, half-plant,—sea-anemones, sponges, sea-cucumbers, jelly-fish.

Each of these genera has many differentiae, and they may accordingly be grouped in many ways,[2] but the most illuminating of those which are suggested by Aristotle is that which depends on the mode of generation.[3] Animals may be arranged in a *scala naturae* according to the degree of development reached by the offspring at the time of extrusion from the parent's body. This depends on the degree of vital warmth possessed by the parent. Aristotle was impressed by the part played by heat in the hatching of eggs,[4] and concluded that it was the agent in all development. Now in respect of heat the greatest difference was that which existed between animals with blood (i.e. red blood), and animals with an analogous but colder liquid. And among sanguineous animals those which had lungs might be inferred to be hotter than those which had not, since the purpose of lungs, according to Aristotle, was to moderate excessive heat.

The highest types of animal are the vivipara, i.e. those which have enough vital heat to produce offspring qualitatively like the parents. Aristotle had not detected the ovum of vivipara, and regarded the embryo as the direct product of copulation. The next type is that in which a 'perfect' egg is produced, i.e. an egg which does not grow in bulk after being laid. The next large family is that in which an 'imperfect' egg is laid. But now comes one of the facts which make the classification of animals so difficult for Aristotle, as for all his successors. Though most fishes lay 'imperfect' eggs, there is a group of them—the cartilaginous fishes—which do not lay an egg at all, but produce live offspring. One might be tempted to regard this as a sign of vital heat, and to place these creatures above the birds and reptiles. But to do this would be to make the mistake of using only one differentia.

[1] *H.A.* I. 6, IV. 1; *P.A.* IV. 6–9.

[2] E.g. according to the mode of respiration, or according to habitat, *H.A.* VIII. 2.

[3] *G.A.* 732 a25–733 b16.

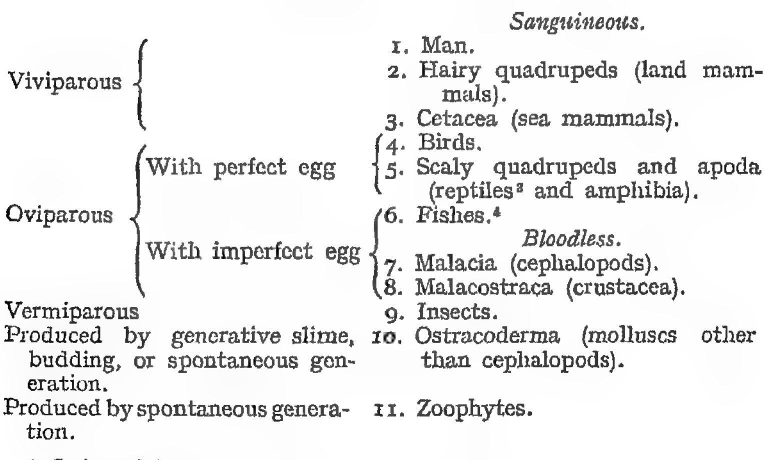
[4] It was for him also the main agent in the production of change, even in the inorganic world.

Aristotle recognises that substantially the place of these creatures is with the other fishes. And he explains their production of live young as due not to excess but to deficiency of heat. They produce eggs in the first instance, but are not hot enough to be able to harden the outer surface of the egg into a shell; they must therefore retain the eggs for protection within the parent's body until they develop into live young.[1]

Lower creatures have to pass through a third stage anterior to that of the egg and the living young—the stage of the grub. Aristotle does not recognise that the grub itself is developed from an egg, but he describes it as turning into a quasi-egg, which is distinguished from a true egg by the fact that no part of it is merely nutriment but the whole of it develops into the living thing.

Lower still come the testacea, which do not produce even a grub. Some produce asexually a slimy fluid from which the young develop; in others the young simply bud off from the parents.[2] And, finally, in all the lower types, and occasionally even as high as the fishes, there occurs spontaneous generation from lifeless matter such as mud.

The resulting *scala naturae* is as follows:—



		Sanguineous.
Viviparous		1. Man.
		2. Hairy quadrupeds (land mammals).
		3. Cetacea (sea mammals).
Oviparous	With perfect egg	4. Birds.
		5. Scaly quadrupeds and apoda (reptiles[3] and amphibia).
	With imperfect egg	6. Fishes.[4]
		Bloodless.
		7. Malacia (cephalopods).
		8. Malacostraca (crustacea).
Vermiparous		9. Insects.
Produced by generative slime, budding, or spontaneous generation.		10. Ostracoderma (molluscs other than cephalopods).
Produced by spontaneous generation.		11. Zoophytes.

[1] *G.A.* 718 ^{b}32–719 ^{a}2.

[2] *H.A.* 546 ^{b}15–547 ^{a}1; *G.A.* 761 ^{a}13–19, ^{b}23–762 ^{a}9.

[3] But vipers are internally oviparous, externally viviparous.

[4] But cartilaginous fishes and fishing-frogs are internally oviparous, externally viviparous, and some members of classes 6–9 are spontaneously generated.

Reproduction

The phenomena of life may, Aristotle thinks, be divided into three main groups—growth and reproduction, sensation, local movement. Of these the first is the most fundamental, that which may exist alone (as it does in plants), while the others cannot exist without it. And of the phenomena grouped together in it, though the nature of nutrition and its organs aroused his interest, reproduction seems to have done so still more. Not only many of his most remarkable observations but some of his most penetrating discussions bear on this subject. Reproduction may, in his view, take place in either of three ways—spontaneously, from a single parent, or from two parents. That he should have believed in spontaneous generation is, in view of the methods of observation at his disposal, not surprising, and it was many centuries before this belief was refuted. Asexual reproduction by a single parent took place, he held, in plants and in animals which like plants are stationary.[1] But his main interest was in determining the nature of sexual reproduction. He discusses together[2] two associated questions—what is the contribution of each parent, and whether its contribution comes (as Hippocrates thought[3]) from the whole of its body alike or from a determinate part only. The main argument for the former view is drawn from the resemblance of offspring to parents part by part, even (as was supposed) in respect of mutilations and acquired characteristics. To this Aristotle replies that (1) offspring show resemblances to their parents which cannot be accounted for by the transmission of anything material from the part of the body in question—resemblances in voice, nails, hair, gait; (2) men who are not yet bearded or grey-haired beget children who become bearded or grey-haired; (3) children sometimes resemble not their parents but remote ancestors from whom they cannot have inherited material parts direct; (4) plants often resemble the parent plant in respect of parts which the parent plant does not possess at the time of reproduction. Further (5) it may be asked whether the semen comes from the 'homogeneous parts'—the tissues—of the parent, or from the 'heterogeneous'—the organs. Resemblance is most marked in the latter; but these are simply the former compounded in a special way, and no transmission of material parts will account

[1] *G.A.* I. 1. [2] I. 17, 18.
[3] Cf. Darwin's 'pangenesis,' *Variation*, ch. 27.

for resemblance in the mode of composition. 'If something creates this composition later, it would be this that would be the cause of the resemblance, not the coming of his semen from every part of the body.'[1] Aristotle is feeling his way towards the conclusion that the contribution of the male parent is nothing material but is the impressing of a certain form on matter supplied by the female.

Again (apart from other reasons which still repay study), (6) if you argue, from resemblance of offspring to parents in specific bodily parts, that the semen must include something from each such part, you might as well argue that because a son usually wears shoes like his father's, his father's semen must have included something that came from his shoes. The bodily parts are simply the clothing which the germ makes for itself, and it is enough if the semen comes 'from the creative part—from the workman, not the material he works in.'[2] 'Why not say that the semen from the very first is of such a kind that blood and flesh can be made out of it, instead of saying that it itself *is* blood and flesh?'[3]

Having rejected the doctrine of pangenesis, Aristotle proceeds[4] to the other question, What is the actual nature of the contribution of each parent in generation? Being found in the body, semen must be *either* one of its natural parts (a tissue or an organ), *or* something unnatural like a tumour, *or* a surplus product, *or* a morbid secretion, *or* nutriment. Of these, there is little difficulty in seeing that it can only be a surplus product. It must represent a surplus either of useless or of useful nutriment, i.e. either of those elements in food which go to make healthy tissue or of those which do not; and the fact that young and healthy animals have most semen shows that it is the former. It is, in fact, the surplus of useful nutriment in its final form, that in which it goes directly to build up tissue. This final form assumed by nutriment is in sanguineous animals blood, and in bloodless animals an analogous fluid. Semen is obviously not blood, and must therefore be supposed to be a direct product of blood. The bulk of the blood in an animal goes to form its tissues; what is not needed for this goes to make semen. And offspring resemble their parents simply because the surplus resembles the bulk. 'The semen which is to form the hand or the face or the whole animal is already the hand or face or whole animal undifferentiated, and

[1] 722 b1–3. [2] 723 b27–32.
[3] 723 a14–17. [4] 724 a9.

what each of them is actually such is the semen potentially.'[1]

What corresponds in the female to the semen of the male is the menstrual discharge—i.e. the surplus blood which the female, owing to its inferior vital heat, is unable to work up into semen. The semen, being thus more 'formed' than the catamenia, acts as formal or efficient cause of the offspring, while the catamenia are the material cause; the male element works up the female element as rennet curdles milk. There is thus an analogy between natural and artistic production. 'Where the male emits semen this is no part of the resulting embryo; just so no material part comes from the carpenter to the material . . . but the shape and the form are imparted from him to the material by means of the motion he sets up. It is his hands that move his tools, his tools that move the material; it is his knowledge of his art, and his soul, in which is the form, that move his hands or any other part of him with a motion of some definite kind, a motion varying with the varying nature of the object made. In like manner, in the male of those animals which emit semen, Nature uses the semen as a tool and as possessing motion in actuality.'[2] In copulation, animals attain that union of the material and the efficient principle of generation which in plants is permanent; 'animals are like divided plants.'[3] This union which is the condition of reproduction is permanent in plants just because growth and reproduction is the whole of their life; in animals, which have also the higher life of sense and movement, the union is only temporary.

Aristotle turns later[4] to a question which is in principle the same as that already discussed under the name of pangenesis, a question which has played a large part in the history of biology. Do the parts of the young animal exist already preformed in the germ, or are they produced successively by epigenesis, like the meshes of a net? The parts are not, he answers, all present in the embryo. It is not that they are present but too small to be seen, for the lung is larger than the heart and yet appears later. But the earlier part does not produce the later, else it would already have the form of the later part, which it clearly has not. The origin of the development is to be found in the male parent, but the male parent is not in contact with the developing embryo. He imparts movement to the semen; the semen imparts movement to part of the matter supplied by the female; this part sets another in movement, and so

[1] 726 ᵇ15–18. [2] 730 ᵇ10–21. [3] 731 ᵃ21. [4] 733 ᵇ23.

on, as in a machine. 'We cannot,' as Prof. Platt observes,[1] 'solve the riddle any better at the present day; we can only say that no sooner has the spermatozoon penetrated the ovum than there is set up in the latter a series of movements which differentiate it and develop the parts one after another.' Heat is the instrument, but only the instrument, of the development. 'While we may allow that hardness and softness, stickiness and brittleness, and whatever other qualities are found in the parts that have life and soul, may be caused by mere heat and cold, yet, when we come to the principle in virtue of which flesh is flesh and bone is bone, that is no longer so; what makes them is the movement set up by the male parent, who is in actuality what that out of which the offspring is made is in potentiality. This is what we find in the products of art; heat and cold may make the iron soft and hard, but what makes a sword is the movement of the tools employed, this movement containing the principle of the art. For the art is the starting-point and form of the product; only it exists in something else, whereas the movement of Nature exists in the product itself, issuing from another nature which has the form in actuality.'[2]

Aristotle anticipated von Baer in recognising that in development the more general precedes the more specific character. Thus the nutritive soul (which we share with plants and animals) precedes the sensitive, and the sensitive (which we share with animals) the reasonable.[3] Soul, when it has a material basis, requires one 'more divine' than any of the four elements, and such a basis for the nutritive and the sensitive soul is found in the pneuma which gives semen its foamlike quality—something not air and not fire, but 'analogous to the element of the stars.'[4] Reason alone has no connexion with matter; it 'alone comes in, over and above, from outside, and is alone divine.'[5] The question has been much discussed, at what time Aristotle supposes reason to enter the semen; he is quite silent on this point. The complete distinction,

[1] Trans. of *G.A.*, 734 ᵇ16 n. [2] 734 ᵇ31–735 ᵃ4.

[3] 736 ᵃ35–ᵇ5.

[4] Elsewhere (II. 5) Aristotle says (reasoning from the fact that wind-eggs have in some sense life—else how could they go rotten?) that the female element has nutritive soul, the specific contribution of the male parent being sensitive soul. Even the female has pneuma, though this is not powerful enough to concoct blood into semen. Cf. p. 105, n. 3.

[5] 736 ᵇ27–737 ᵃ1.

in respect both of character, of origin, and of destiny, between reason and the other faculties of soul is a doctrine to which Aristotle returns in several of his works,[1] though there are other passages in which he seems to aim at maintaining the continuity of reason with sensation.[2]

Growth being the minimum vital function, the first bodily part to come into existence must be one which has a 'principle of increase,'[3] and this, Aristotle holds on grounds both of observation and of theory, is the heart. 'For whenever the young animal has been separated from both parents it must be able to manage itself, like a son who has set up house away from his father. Hence it must have a first principle from which comes the ordering of the body at a later stage also . . . For the animal grows, and the nutriment, in its final stage, of an animal is the blood or its analogue, and of this the blood-vessels are the receptacle, wherefore the heart is the origin of these also.'[4] The successive growth of the other parts may from one point of view be explained as due to the action of heat and cold, but this is a one-sided explanation; it is equally necessary to realise their final cause, the way in which they subserve the life of the organism. Aristotle's views as to the order of development are no doubt based on observation of embryos, but he is able to provide himself with an *a priori* explanation as well. Yet he has a sound scientific belief in the supremacy of observation. 'The facts' (about the generation of bees) 'have not yet been sufficiently grasped; if ever they are, then credit must be given rather to observation than to theories, and to theories only if what they affirm agrees with the observed facts.'[5]

The cause of sex-determination had been much discussed before Aristotle's time. He finds[6] that none of his predecessors had approached the facts closely enough, and offers himself a theory which he considers more satisfactory. It is, he thinks, a mistake to suppose that male organs can be developed in one embryo, female in another, unless there be first some difference in the vascular system, which is the framework on which the whole body is built up. The sexual parts are not the causes of sex but the concomitants of a difference which goes deeper; a male is produced when the embryo owing to its greater heat is able to 'concoct' the surplus blood into

[1] E.g. *De An.* III. 4, 5; *Met.* 1070 a26; *E.N.* 1178 a22.
[2] *An. Post.* II. 19; *Met.* A. 1.
[3] G.A. 735 a15.
[4] 740 a5–23.
[5] 760 b30–33.
[6] IV. 1.

semen, a female when it has not this power and the surplus blood remains blood (as the menstrual discharge shows that it does in females). And the embryo is hotter or colder according as the semen of the male parent has or has not succeeded in mastering the material supplied by the female parent. Thus sexual determination is in principle present from the very moment of coition. The sexual parts are formed later in response to the need of the organism for one kind of organ if it has the power of producing semen, and for another if it has to accommodate large quantities of surplus blood which it cannot turn into semen.

The facts of heredity are explained on similar principles.[1] If the male parent prevails completely over the female, the offspring are male and also resemble the father in other respects. If the male parent prevails but the impulse it imparts is modified by the reaction of the female, the young are like the grandfather instead of the father; or if the impulse is more deeply modified, the young is like some more distant ancestor on the father's side. If the male parent prevails *qua* individual but not *qua* male, the young are female but like the father; if *qua* male but not *qua* individual, they are male but like the mother. If the female parent prevails, the young are female and like the mother. If the female element, though it prevails, is modified in the process, the young are like some ancestor on the female side. If the impulses imparted by the parents are confused together, the young are not like any ancestor but simply preserve the character of the species. Finally, if the confusion is still more complete, the young preserve nothing but the generic character of being animals; in other words they are monsters on the borderline between the species to which their parents belong and some other.

TELEOLOGY

Among the characteristics of animals Aristotle draws an important distinction.[2] Some qualities characterise the whole of a species, others (e.g. in certain cases colour) vary within the species. These two groups are to be differently explained. The former are to be explained by a final, or, in other words, by a formal cause; the animals which have eyes, for instance, have them because sensation is one of the ends for which

[1] IV. 3. [2] 778 ^{a}16–^{b}19.

animals exist, one of the essential characteristics of an animal. 'When we are dealing with definite and ordered products of Nature, we must not say that each *is* of a certain quality because it *becomes* so, but rather that they *become* so because they *are* so and so, for the process of becoming attends upon being and is for the sake of being, not *vice versa*.'[1] Variable characteristics on the other hand are to be explained by the material or the efficient cause. 'An eye the animal must have of necessity (for the fundamental idea of the animal is of such a kind), but it will have an eye of a particular kind, of necessity in another sense.'[2] There is thus a limit to Aristotle's use of final causes; he is aware of spontaneous variations the explanation of which must lie in mechanical causes.

Yet his way of approaching the problems of organic life is primarily teleological. This is most evident in his work *On the Parts of Animals* and in what may be regarded as an appendix to it, the work *On the Progression of Animals*. At the beginning of the former work[3] he lays it down that for the biologist final causes are more important than efficient causes. 'Consider how the physician or how the builder sets about his work. He starts by forming for himself a definite picture . . . of his end . . . and this he holds forward as the reason and explanation of each subsequent step that he takes . . . Now in the works of nature the good end and the final cause is still more dominant than in works of art such as these.'[4] So closely is the procedure of nature assimilated to that of art that Aristotle here actually includes the study of nature among the constructive sciences rather than the theoretical. 'The mode of necessity and the mode of ratiocination are different in natural science from what they are in the theoretical sciences' (i.e. metaphysics and mathematics). . . . 'For in the latter the starting-point is that which is; in the former that which is to be. For it is that which is yet to be—health, let us say, or a man—that, owing to its being of such and such characters, necessitates the pre-existence or previous production of this and that antecedent; and not this or that antecedent which, because it exists or has been generated, makes it necessary that health or a man is in, or shall come into, existence. Nor is it possible to trace back the series of necessary antecedents to a starting-point, of which you can

[1] b1–6. [2] b16–18.
[3] Cf. the defence of the study of animals, 645 a7–26.
[4] 639 b16–21.

say that, existing itself from eternity, it has determined their existence as its consequent.'[1] Thus the proper order of enquiry is not to start with the process of formation of each animal, but to consider first its actual characteristics, and then to deal with their evolution; 'for the process of evolution is for the sake of the thing evolved, and not this for the sake of the process.'[2] Empedocles had adopted the opposite method. He held for instance that the backbone is divided into vertebrae not for any purpose, but 'because it happened to be broken owing to the contorted position of the foetus in the womb.'[3] Others had said 'that the water contained in the body causes by its currents the formation of the stomach and the other receptacles of food or of excretion; and that the breath by its passage breaks open the outlets of the nostrils.'[4] This is as if a woodcarver, when asked what the forces are by which the hand he carves receives its shape, were to say 'by the axe or the auger.' The answer is true but insufficient. 'It is not enough for him to say that by the stroke of his tool this part was formed into a concavity, that into a flat surface; but he must state the reasons why he struck his blow in such a way as to effect this, and what his final object was.'[5] The mistake of the older thinkers is that while they take account of material and efficient causes, they know nothing of formal or (which comes to the same thing) of final causes. Just when Democritus had begun to have an inkling of the notion of essence, Socrates (Aristotle regretfully remarks) had diverted attention from nature to politics and ethics.[6] Even Democritus had made the mistake of supposing that 'configuration and colour constitute the essence of the various animals and of their several parts.'[7] To do this is to emphasise structure and to forget function. A dead hand has the same structure as a living one, but it is not really a hand since it cannot do the work of a hand. The biologist must take account of that which differentiates every living creature and every living organ from what is dead, and this is soul. Not that he should take account of every form of soul. The rational soul which is peculiar to man is beyond his purview; but he must take account of the powers of soul by which living things grow and reproduce their kind, by which they have sensation, and by which they move. Reproduction has for Aristotle this special interest, that the perpetuation of the type is for him the clearest evidence of the purposiveness

[1] *Ib.* 30–640 a8. [2] 640 a18. [3] *Ib.* 21. [4] b12–15.
[5] 641 a5–14. [6] 642 a24–31. [7] 640 b29–31.

of nature. 'Whenever there is plainly some final end, to which a motion tends should nothing stand in the way, we always say that such final end is the aim of the motion; and from this it is evident that there must be something really existing, corresponding to what we call by the name of Nature. For a given germ does not give rise to any chance living being, nor spring from any chance one; but each germ springs from a definite parent and gives rise to a definite progeny. And thus it is the germ that is the ruling influence and fabricator of the offspring.' [1]

Aristotle's teleology is, it will be seen, an 'immanent' teleology. The end of each species is internal to the species; its end is simply to be that kind of thing, or, more definitely, to grow and reproduce its kind, to have sensation, and to move, as freely and efficiently as the conditions of its existence—its habitat, for instance—allow. Only once, perhaps, does Aristotle suggest (and only doubtfully) that a characteristic of one species may be designed for the benefit of another; sharks have their mouth on their under surface in order that, while they turn to bite, their prey may escape—but also to save them from over-eating! [2] The general principle is that 'nature never gives an organ to an animal except when it is able to make use of it.'

When Aristotle describes the structure of animals as due to purpose, the question naturally arises, to whose purpose? There is no suggestion that it is due to the purpose of the individual animal. It is generally nature that is described as acting for a purpose, but nature is not a conscious agent; it is the vital force present in all living things. Once God is added; 'God and nature make nothing at random.' [3] But the God whom Aristotle seriously believes in (witness the *Metaphysics*) is a God wrapped in self-contemplation and operating on the world solely as object of its desire; the expression 'God and nature' seems to be a concession to ordinary ways of thinking, and Aristotle appears to rest content, as many thinkers have done since, with the surely unsatisfactory notion of purpose which is not the purpose of any mind.

His teleology is not complete. He has to admit the existence

[1] 641 ᵇ23–29.

[2] 696 ᵇ24–32. In *Pol.* 1256 ᵇ15–22 Aristotle adopts the Socratic position that plants exist for the sake of animals, and the lower animals for the sake of man. But there he is not writing biology.

[3] *De Caelo*, 271 ᵃ33.

of many imperfections in the structure of animals. These cannot be ascribed, as imperfections in a work of art would be, to defect in the maker. They are ascribed to defect in the material, not in the sense that there is anything vicious in matter as such or in any particular matter, but in the sense that nature often has to work with matter which, however good for other purposes, is not good for the purpose in hand. Two types of imperfection are of particular interest. There is, first, imperfection in individual members of a species. When nature has succeeded in making some individuals perfect, why (we may ask) does it not succeed in making the others perfect? Owing to the variability of matter, says Aristotle. The heavens perfectly obey eternal law because they are made of the pure substance of the 'fifth element'; terrestrial things are subject to variation because their matter is never pure earth, water, air, or fire, but is formed of these in an endless variety of combinations. For Aristotle has no theory of definite chemical affinities, still less any notion that elements can combine only in fixed proportions.

We must, secondly, take account of rudimentary organs, organs which serve a purpose in most species of a genus, but in some are so small or weak as to serve no purpose. Of these Aristotle can only say that they are present 'by way of token,'[1] to indicate the normal though in such cases unfulfilled intention of nature.

Aristotle's teleological explanations are not all equally successful. He often succeeds in explaining, quite as a modern evolutionist might, the external parts of animals. Cuvier could not praise too highly his account of the adaptation of the visible parts of birds to their varied conditions of life. In dealing with the internal parts he is greatly hampered by the lack of sufficiently delicate dissection, and by the complete absence in his time of sound anatomical and physiological ideas. He does not realise, e.g., the existence of the nervous system and the primary importance of the brain; the use of the brain is, according to him, to correct an excess of heat. More valuable than his detailed explanations in this region are certain great generalisations at which he arrived. He recognised, for example, the continuity of all life. He sees that there are some plants which have a minimum of life and can hardly be distinguished from lifeless matter; that there are creatures which bridge the gulf between plants and animals; that there

[1] *H.A.* 502 ^{b}23, 611 ^{a}31; *P.A.* 669 ^{b}29, 670 ^{b}12, 689 ^{b}5.

are connecting links between the genera of animals; and that man is, as regards all except his reason, continuous in kind with the higher quadrupeds.[1] He is the first to formulate the principle of homology, e.g. between legs, wings, and fins, or between feathers and scales.[2] He recognises the law of organic equivalents, whereby the absence of some organ in a species is explained by the fact that the available matter has been used up in forming some alternative organ.[3] He detects the division of labour in nature, the apportionment of one organ to each function and of one function to each organ,[4] although he points out that nature sometimes produces an organ for one purpose and uses it for a second in addition.[5] He illustrates well the relation between differences of food and differences in the organs of nutrition.[6] He remarks that no animal has more than one adequate means of defence.[7] In these and many other cases the teleological method has enabled him to detect facts which no mechanical treatment would have discovered. And if his teleology is sometimes too facile, and merely diverts attention from the genuine mechanical causation, this is a fault which may be pardoned in view of the enormous superiority of his biology to any that preceded it, and to any that followed it within many centuries.

[1] Cf. *H.A.* VIII. 1; *P.A.* 681 ^{a}9–^{b}8, etc.

[2] *H.A.* 486 ^{b}17–22; *P.A.* 693 ^{b}2–5, 695 ^{b}20–25, 696 ^{a}25–27; *I.A.* 709 ^{b}30, 713 ^{a}1, 714 ^{b}3. The homology is one of function rather than of structure, and Aristotle's recognition of it is not based on any profound anatomical study.

[3] *P.A.* 651 ^{b}13, 655 ^{a}27, 658 ^{a}35, 663 ^{a}32, 664 ^{a}1, 685 ^{a}25, 689 ^{b}30, 694 ^{a}27, ^{b}18, 695 ^{b}7; *I.A.* 714 ^{a}16. Yet Goethe claimed originality for his principle that 'Nature must save in one part in order to spend in another.'

[4] *P.A.* 683 ^{a}22; *Pol.* 1252 ^{b}1.

[5] *P.A.* 659 ^{a}20, 662 ^{a}18, 688 ^{a}22, 690 ^{a}2.

[6] *P.A.* III. 14.

[7] 663 ^{a}17, cf. *H.A.* 487 ^{b}26, 504 ^{b}7.

CHAPTER V

PSYCHOLOGY

SOUL AND ITS FACULTIES

THE object of psychology is 'to discover the nature and essence of soul, and its attributes.'[1] The method of dealing with the attributes is demonstration; is there, he asks, a corresponding method of discovering the essence? He suggests division as a possible method, and in effect adopts it. The first step is to determine to which of the main divisions of being—the categories—soul belongs, and again whether it is a potentiality or an actuality. But at this point a difficulty arises. Suppose that there are different parts of soul, and various species or perhaps even genera arising from the presence of these parts in various combinations; it may then be that there is no one definition of soul. It may be that the primary facts are the different kinds of soul, and that there is no one thing answering to the name 'soul' in general, or only a slight nucleus of common nature in the various souls.[2]

Aristotle's answer is in effect that the kinds of soul are neither so much alike that any single definition of soul will give a sufficient idea of its varieties, ranging from its humble manifestations in plants and zoophytes to the heights it reaches in man or in God, nor yet so different that we cannot recognise a common nature in all its varieties. Geometrical figures may be arranged in an order beginning with the triangle and proceeding to more and more complex forms, each of which contains potentially all that precede. So too the forms of soul form a series with a definite order, such that each kind of soul presupposes all that come before it in this order, without being implied by them. The minimal soul is the nutritive; for this exists in all living or 'besouled' beings—in plants and animals alike. Next comes the sensitive soul, which exists in all animals. Within

[1] *De An.* 402 a7. [2] 402 a10–b8.

the sensitive soul the same scheme reappears, for touch is a minimal form of sensation presupposed by all the others, present whenever they are and sometimes when they are not.[1] And it is perhaps not too fanciful to say that for Aristotle touch, taste, smell, hearing, sight form a series in which the distinctive nature of sensation, that of 'receiving the form without the matter' of its objects is increasingly manifested.[2]

The sensitive soul has not merely the function of perceiving, but as a necessary consequence of this that of feeling pleasure and pain, and therefore of desiring, which is found in all animals. There are two other faculties which are outgrowths from the sensitive faculty, found in most animals but not in all. (1) There is an outgrowth from it on its cognitive side, which Aristotle calls imagination (*φαντασία*); of this in turn memory is a further development. And (2) there is an outgrowth from it on its appetitive side, the faculty of movement. Finally there is a faculty peculiar to man, that of reason.[3] This is treated as generically distinct from perception; yet to perception, when acting not in any of its specialised forms as sight, hearing, etc., but in its generic nature as perception, are assigned various functions which tend to bridge the gulf between sense and reason.

Aristotle tries to show the necessity of this order in the faculties of soul. The life of all living things, if it is to be maintained at all, must be maintained through the processes of growth and decay, and the nutritive function must be at work in all living things to preserve their existence. Sensation is not equally necessary; plants and motionless animals find their food automatically in the soil they grow from. But the power of movement presupposes sensation, since it would be useless without sensation; it is no use for an animal to move about unless it can recognise its food when it finds it. Further, touch is the most indispensable of the senses. It is not necessary that an animal should distinguish at a distance what is good and what is bad for it; but it is necessary that it should do so when actually in contact with the object; and further it is in virtue of its tangible qualities that food nourishes. Taste also, which is a modification of touch, is indispensable since it

[1] 414 a2–4, 415 a3–6, 435 a12.
[2] Beare, *Greek Theories of Elementary Cognition*, 230 f. Cf. *De An.* 429 a2.
[3] 413 a22–b27, 414 a29–415 a12.

is the recognition of the qualities whereby food attracts and what is not food repels the animal.

The other senses are means not so much to being as to well-being. Perception at a distance, though not necessary, is a help to animals in getting their food and in avoiding what is bad for them. And further, hearing and sight in their various ways minister to the life of thought; hearing is of peculiar value because the use of speech is the main instrument of teaching and learning, and sight because it reveals with such precision differences between things not only in respect of its proper object, colour, but in respect of their number, size, shape, and movement.[1]

Soul and Body

Aristotle raises early in the *De Anima* another question that takes us into the heart of his psychology. Are the attributes of soul, he asks, all common to its possessor, the unity of soul and body which we call a living being, or are some of them peculiar to soul? [2] If soul has peculiar attributes, it will be separable from body. If not, it will only be thinkable apart from body by an act of abstraction akin to that by which we separate the mathematical attributes of bodies from their physical character. Most mental phenomena are attended by some bodily affection. And, anticipating a famous modern theory, he adds that where the requisite bodily conditions are present, emotions such as anger and fear are produced by the slightest mental cause or in the absence of any. Mental phenomena therefore are 'formulae involving matter.' The true definition of them will omit neither their form or end (their rational causation) nor their matter (their physiological conditions). Thus either soul, or at any rate this kind of soul, comes within the scope of the physicist. We should not define anger either as the dialecticians do, merely as desire of retaliation, or as the ordinary physicist does, merely as the boiling of the blood about the heart. The forms which are embodied in matter *need* a particular kind of matter for their embodiment, and it is as important to know this as it is to know the forms themselves.[3]

[1] III. 12, 13; *De Sensu*, 436 ^{b}10–437 ^{a}17; *Met.* 980 ^{a}21–^{b}25.
[2] 403 ^{a}3–5.
[3] 403 ^{a}5–^{b}19, 412 ^{b}6–9, 413 ^{a}4–9.

It will be seen that Aristotle is no holder of a two-substance doctrine. Soul and body are not two substances, but inseparable elements in a single substance. But the word 'inseparable' here needs careful consideration. Soul and body, like form and matter in general, are in a sense separable. The matter which is now linked with a soul to form a living thing existed before the union began and will exist after it ceases. It is only from form, not from this form, that this matter is inseparable. And again this form can exist apart from this matter. For in Aristotle's view it is one form that is embodied in all the members of a species, and it can exist independently of any one member though not of all. It requires for its existence, therefore, not this matter but this kind of matter. It requires a body with a certain kind of chemical constitution and a certain shape, and it cannot exist embodied in another kind of body. To speak of transmigration of human souls into animal bodies is like supposing that carpentry could embody itself in flutes instead of in chisels.[1] Nor can soul exist disembodied—though here Aristotle makes a reservation in favour of the highest element in the human soul, the reason, which, as it 'comes in from outside,'[2] exists too after the body's death,[3] though whether in an individual form or merged in some wider spiritual unity, Aristotle does not say.

From this general theory of the relation of soul and body, it follows that Aristotle does not emphasise the notion of the self as a pure spiritual being to which its body is as much part of the outside world as other physical things. Rather, for him, soul and body form a union which while it lasts is complete, and in which soul and body are merely aspects distinguishable by the philosophic eye. A notion like that of Descartes, that the existence of the soul is the first certainty and the existence of matter a later inference, would have struck Aristotle as absurd. The whole self, soul and body alike, is something given and not questioned. But so too is the physical world. Aristotle sometimes uses language suggestive of idealism, but in the main he might perhaps be called a naïve realist. The language which suggests idealism is that in which he represents thought as identical with its object.[4] But the underlying view is not that the object is constituted by thought, but that the mind is a 'place of forms' or 'form of forms,'[5] a thing which until it

[1] 407 ^{b}24.
[2] *G.A.* 736 ^{b}28.
[3] 413 ^{b}6, ^{b}24–27, 429 ^{a}11, 24–27, 430 ^{a}22.
[4] E.g. 429 ^{b}6, 430 ^{a}3.
[5] 429 ^{a}27, 432 ^{a}2.

apprehends some universal is a mere potentiality, and which when it does apprehend a universal is entirely characterised by the apprehension, so that it may be said to have become one with its object. This is not idealism but extreme realism, allowing for no modification, still less construction, of the object by mind.

There are three marks of soul which Aristotle finds to have been recognised by his predecessors. He accepts all three characteristics, but rejects earlier theories with regard to them. Soul is a cause of movement but not self-moving; it moves without being moved. It knows, but it must not for that reason be thought to be composed of the same elements as that which it knows. It is incorporeal, and the earlier theories do not conceive its incorporeality distinctly enough.

At least one other important point emerges in the criticism of earlier thought which occupies Book I of the *De Anima*. Is the whole soul, Aristotle asks, involved in each of its activities, or should these be assigned to different parts? [1] Should life be assigned to one or more of these parts, or has it a distinct cause? If the soul is divisible, what holds it together? Not the body (which rather is held together by the soul). What holds soul together must have the best title to the name 'soul.' If *this* has unity, why not ascribe unity to the soul itself at the outset; if it is divisible, what holds *it* together? Again, does each part of the soul hold together some part of the body? Plants and some insects, after division, have all the parts of their soul in each of the separated parts of their body. Thus the fission of which the soul admits is not into qualitatively different parts, but into parts each of which has the quality of the whole. Soul in fact, though Aristotle does not put it so, is homoeomerous, like a tissue, not an organ. And though he often uses the traditional expression 'parts of the soul,' the word he prefers is 'faculties.' His is a faculty psychology, but not in the sense that he evades the task of the genuine explanation of facts by referring to a mystical faculty of doing this or doing that. He is simply taking account of the fact that the soul does exhibit a variety of operations, and that behind each of these intermittent operations we must suppose a permanent power of so operating. But these faculties do not coexist like stones in a heap. They have a definite order, an order of worth and a reverse order of development in the individual. Further, they have a characteristic which we may roughly call inter-

[1] 411 a26 ff.

penetration. Thus for instance intellect and desire are distinct faculties, but the highest species of desire is of a kind which can only occur in beings which have intellect, and is itself intellectual.[1] Choice or will may equally well be called desiring reason and reasoning desire, and in it the whole man is involved.[2]

In the second book Aristotle begins the positive exposition of his own theory. He first defines soul. It is clear to what category it belongs. For bodies, above all things, are universally held to be substances; and among bodies, above all others natural bodies, for these are the origin of all others, inasmuch as artificial bodies are made out of them. Now among natural bodies are included not only the elements and their inanimate compounds but also animate bodies. And animate bodies are substances not in the secondary sense in which matter (or potentiality) and form (or actuality), which are really elements in substance, may be called substance; they are individual independent substances concrete of matter and form. In this concrete unity it is evident that body plays the part of matter or possessor of attributes, and soul that of form or essential attribute. Aristotle is helped here by the fact that the natural expression in Greek for a living thing is *ἔμψυχον σῶμα*, 'besouled body,' where 'besouled' evidently stands for the attribute that distinguishes living from other bodies, the power (at the least) of self-nourishment, with or without the powers that mark off the higher living things from the lower. Soul is, then, the form or actuality of a living thing. But 'actuality' is ambiguous. As compared with a layman, a man of science has the actuality of knowledge even when he is not thinking scientifically; but he has it in a fuller sense when he is so thinking. Similarly soul is the first actuality of a living body, while its exercise of function is its second or fuller actuality. A man is besouled even when he is asleep, but he is not then fully actual; his functions, except his vegetative function, are then dormant. Now a living body is just a body endowed with organs, i.e. containing a diversity of parts cunningly adapted to different activities. Soul is thus 'the first actuality of a natural body furnished with organs.' In the living thing we distinguish the body which is matter and the soul which is form, just as in an axe we distinguish its material and its axeness, or in the eye the pupil and the power of sight; and we distinguish the first actuality, the soul, from the second actuality, the

[1] 432 b5, 433 a22–25, b28. [2] *E. N.* 1139 b4.

waking life, as we distinguish axeness from actual cutting and the power of sight from actual seeing. Obviously, then, soul is inseparable from body unless there be some part of soul—Aristotle is thinking of reason—which is not the actuality of any body.[1] But we are left with the question how, if soul is such an actuality, any part of it can fail to be such; the connexion of reason with the other faculties is one of the obscurest parts of his psychology.

A definition so abstract as this will not help us much to understand the varied phenomena of soul, and Aristotle, aware of this, proceeds to give a more concrete account, one which specifies in the way indicated above the main faculties involved in soul. He then goes on to treat of these in detail, and first of nutrition.

Nutrition

It is a mistake, he points out, to ascribe the growth of living things to the mere action of the elements contained in them.[2] Even fire or heat is but an auxiliary cause of nutrition. In all natural wholes there is 'a limit and a ratio of growth and size'—a limit of size proper to an animal of any given species, a ratio to be observed between the parts of its body; and this limit and ratio belong to the side of form not of matter, of soul not of body. The truth is, not that fire or heat is the cause of growth, but that soul acts on the hot substance in the body,[3] which in turn produces qualitative change in the food, just as the steersman moves his hand, which in turn moves the rudder and thereby steers the ship. The soul is an unmoved mover, the hot substance moves by being moved, the food is merely moved (i.e. chemically changed).

It had been disputed whether nourishment is effected 'by what is like' or 'by what is unlike.' Aristotle solves the question by pointing out that nutrition is assimilation, the making like of what was unlike.

The ultimate aim of nutrition is the preservation not of the individual life, which is in any case doomed to speedy extinc-

[1] Aristotle points out elsewhere (415 b7–28) that soul is not only the actuality or formal cause of the body but (in accordance with the general principle of the identity of formal, final, and efficient cause) its final cause and the efficient cause of all the changes it originates, whether of place, of quality, or of size.

[2] II. 4.

[3] Cf. p. 105 n. 3.

tion, but of the species, whereby alone living things can 'share in the eternal and the divine.' Reproduction is ascribed by Aristotle to the same faculty as nutrition; and the full name of the primary or minimal faculty of soul is 'the faculty of nutrition and reproduction.'

Sensation

Sensation had been treated by most of Aristotle's predecessors as if it were essentially a passive process in which the sense-organs are qualitatively changed by the object. In opposition to this view he insists[1] that if sensation is to be called an alteration, a distinction must be drawn between two kinds of alteration. Sensation is not an alteration of the kind which is simply the replacement of a state by its opposite, but of that which is the realisation of potentiality, the advance of something 'towards itself and towards actuality,'[2] or in the language of the *Physics*[3] a perfecting. The distinction is sound but does not take us far enough. The building of a wall is also a perfecting,[4] and the distinction between the two kinds of alteration, while it brings out the fact that the act of sensation is that for which the sense-organ and the faculty of sensation all along existed, does not bring out the distinctively mental, non-corporeal nature of the act. This is better brought out in another passage[5] in which Aristotle emphasises the complete difference between the physical modification of plants or inanimate things by sensible qualities, and the mental fact of sensation produced in animals by these same qualities. And it is still better brought out in the description[6] of sensation as a discriminative power from which the highest acts of cognition are reached by a continuous development.

But Aristotle cannot be said to hold successfully to the notion of sensation as a purely mental activity having nothing in common with anything physical. He is still under the influence of earlier materialism. One set of thinkers had described perception as perception of like by like, another as perception of unlike by unlike. Both views agreed in supposing perception to be a modification of the body of the percipient by an external body. Aristotle solves the question, as he has

[1] II. 5. [2] 417 ᵇ6, 16. [3] 246 ᵇ2, 247 ᵃ2.
[4] 246 ᵃ18–20. [5] 424 ᵃ32–ᵇ18.
[6] 424 ᵃ5, 432 ᵃ16; *An. Post.* 99 ᵇ35 ff.

solved the similar question about nutrition, by describing the process as one in which things unlike become like, the sense organ is assimilated to the object. The hand becomes hot, the eye coloured,[1] and—he would add—the tongue becomes flavoured, the nose odorous, the ear resonant. Perception is distinguished from nutrition by the fact that while in the latter the matter of the food is absorbed, the former is receptive of form without matter.[2] Now, if this assimilation of the organ to the object takes place, it does nothing to explain the essential fact about perception, that on this physical change supervenes something quite different, the apprehension by the mind of some quality of an object. It is only if reception of form means *awareness of* form that it is a true description of perception; and the description of the organ as becoming *qualified by* the form of its object is irrelevant. The phrase 'receptive of form' covers a radical ambiguity.

There is thus a certain amount of confusion between psychology and physiology in Aristotle's account of perception. To pursue his physiology into somewhat greater detail, his view is as follows. Each sense-organ is sensitive to one or more sets of qualities ranging between extremes; e.g. the eye is sensitive to colour, which for Aristotle forms a series in which each intermediate consists of white and black combined in a certain ratio. To be sensitive to the whole range of these qualities, the organ must itself be characterised by a mixture of them in which neither extreme too much preponderates. The sense is thus a mean or ratio. In order that the organ may be affected by an external object, three conditions must be satisfied. (1) The change set up by the object in the medium must have a certain intensity; otherwise the inertia of the organ will prevent it from being affected. This is why very small coloured objects or very slight sounds cannot be perceived separately, although when they form parts of larger objects or louder sounds they are perceived potentially in the sense that they can be recognised by thought as constituents involved in the perceived object. And (2) the ratio in which the contraries are combined in the object must be to some extent different from the ratio of their combination in the organ. Thus the hand does not perceive as hot or cold what has the same temperature as itself. But (3) the difference between the ratios must not be too great. A certain variation in the ratio of the contrary qualities is compatible with the continued existence of

[1] 425 b22. [2] 424 a18.

the organ, but if the ratio is too greatly disturbed the organ is destroyed.[1] And since touch is the indispensable sense, an excess of certain of the tangible qualities—heat, cold, or hardness[2]—will in destroying the organ destroy the animal as well.[3]

The actualisation of perception is at the same time the actualisation of the object. Actual sound and actual hearing are merely distinguishable aspects of a single fact. Apart from actual hearing there is not actual but only potential sound. At the same time, Aristotle opposes the earlier view that 'without seeing there is neither white nor black.'[4] His meaning must be that over and above their primary qualities objects have in the absence of percipients a definite qualification in virtue of which they produce sensations when percipients are present. But into the difficulties presented by these 'permanent possibilities of sensation' he does not enter.

Aristotle divides the objects of perception into three classes.[5] Two of these are perceived directly—the sensibles peculiar to each sense and those which are common to all,[6] or at least to sight and touch.[7] About the former, deception is impossible or at all events infrequent. The full list of the common sensibles recognised by Aristotle is—movement and rest, number and unity, shape, size, and (we should probably add) time.[8] The third kind of object of perception is that which is perceived incidentally as a concomitant of a 'special sensible'; if you see a white object which is the son of Diares, you incidentally perceive the son of Diares.

There is much that is of not merely historical interest in Aristotle's treatment of the special senses and their objects.[9] A topic to which much attention is directed is the constitution of the organ and of the medium—and he holds that even touch employs a medium (the flesh), the organ of touch being not the flesh but 'something within.'[10] With regard to sight, he builds his theory[11] on the observed facts (1) that an object placed upon the eye is not seen (which shows that a medium is neces-

[1] 424 a2–10, 26–b1, 426 a27–b8, 429 a29–b3, 435 a21.
[2] Why not softness also?
[3] 435 b7–19.
[4] 425 b25–426 a27; *Cat.* 7 b35–8 a12; *Met.* 1010 b31–1011 a2.
[5] II. 6.
[6] 418 a10.
[7] *De Sensu*, 442 b5–7.
[8] 418 a17, 425 a15; *De Sensu*, 437 a9, 442 b5, 450 a9, 451 a17; cf. *De An.* 433 b7.
[9] II. 7–11; *De Sensu*, 3–5.
[10] 422 b19–23, 34–423 a17, 423 b1–26.
[11] II. 7.

sary), and (2) that whereas fire can be seen either in light or in darkness, non-luminous coloured objects can only be seen in light.[1] He supposes therefore that fire (as well as the heavenly bodies) has a power which non-luminous objects have not; that of 'making actually transparent the potentially transparent.' Potential transparency is a character common to air, water, and many solids. The state of actual transparency in such a body is light. Light is thus not a movement but an actuality or state; and it is produced not by a movement but by an instantaneous qualitative change effected in some potentially transparent medium. This is the first stage. The second is that in which a potentially coloured body acts upon, i.e. produces a further qualitative change in, the now actually transparent medium, and thus becomes actually coloured and produces actual sight. Alexander of Aphrodisias, recognising the two stages involved in Aristotle's theory—the production of light and the production of colour—goes as far as to call colour 'a sort of second light.' Fire and the heavenly bodies are the only things which can produce the first change in the medium as well as the second; they can be seen 'in the dark' just because they first make the dark light.

So far the transparent has figured only as external medium, but in the *De Sensu*[2] its significance is extended in two ways. (1) Aristotle notes as a result of certain observations that the real organ of sight is not the outer surface of the eye but something within the head. A transparent medium must therefore extend right up to the inner organ, and hence the crystalline lens has to be composed of a transparent substance, water. And (2) transparency is now treated as being present in greater or less degree in all bodies whatsoever, and colour is described as the boundary of the transparent *in bodies* (i.e. in so far as the transparent is imprisoned in bodies mainly opaque), while light is the actuality of the transparent *in its unbounded condition*, i.e. as it exists in transparent media such as air and water.

Sensus Communis

Aristotle's account of the special senses, though it contains much acute reasoning, is largely vitiated by being bound up with an untenable physics and physiology. We must turn to

[1] Even of phosphorescent objects the 'proper colour' cannot be seen in the dark, 419 ᵃ2–6.

[2] 438 ᵃ12–16, ᵇ5–16, 439 ᵃ21–ᵇ14.

his account of unspecialised perception, *sensus communis*. The phrase is rare in Aristotle,[1] but conveniently sums up a whole mass of doctrine, provided it be interpreted not as being another sense over and above the five and apprehending a more varied group of objects, but as the common nature inherent in all the five. We must think of sense as a single faculty which discharges certain functions in virtue of its generic nature but for certain purposes specifies itself into the five senses and creates for itself organs adapted to their special functions.

The functions in which the perceptive faculty operates in this unspecialised way are the following :—(1) The perception of the 'common sensibles.'[2] All of these are, Aristotle maintains, perceived by means of movement, i.e. a mental movement which he regards (rather obscurely) as proportioned to the object. The common sensibles are incidental to the special sensibles[3] just as much as are the objects which are technically called the 'incidentals,' but he distinguishes between the two on the ground that whereas the coincidence, say, of sweet with white or with the son of Diares is a merely occasional one, *every* object—at least of sight and touch—has size, shape, duration, either rest or movement, either unity or number. We perceive the common sensibles by sight not qua sight, but in virtue of the general perceptive faculty which besides its specialised functions of sight, hearing, etc., has an unspecialised function relative to the qualities common to all sensible objects.

(2) The perception of the 'incidental sensibles.' This is first illustrated by the perception that the white object seen is the son of Diares.[4] But later[5] a distinction is drawn. There is (*a*) such perception as that of the sweet by sight when the two qualities occur together (i.e. in an object which we have previously seen and tasted but are now only seeing), and (*b*) such perception as that of the son of Cleon by sight. In both cases modern psychology holds that memory and association are involved as well as perception ; the cases differ in regard to the complexity of what is called up by association on the stimulus of the present perception. In ascribing the apprehension of the incidentals and of the common sensibles to perception

[1] It is found in 425 a27 ; *De Mem.* 450 a10 ; *P.A.* 686 a31 ; cf. *De Mem.* 455 a15.

[2] 418 a10–20, 425 a13–b11, 428 b22–30 ; *De Sensu*, 442 b4–10 ; *De Mem.* 450 a9–12, 451 a16, 452 b7–13.

[3] 425 a15.

[4] 418 a21.

[5] 425 a22–b4.

without definitely recognising the part played by association, Aristotle leaves unexplained (though he notes its existence) the fallibility of such perception as compared with that of the special sensibles.

(3) The perception that we perceive.[1] Is it by sight, Aristotle asks, that we perceive that we see, or by some other sense ? (*a*) If by some other, then (i) since that which perceives sight must perceive the colour which is the object of sight, there will be two senses which perceive colour, and (ii) we must either suppose a third sense by which we perceive that we perceive that we see, and so *ad infinitum*, or come ultimately to a sense which perceives itself ; and if the latter, we might as well have ascribed self-consciousness to the original sense of sight. (*b*) On the other hand if we do this, then since to perceive by sight is to see, and what is seen is colour or the coloured, that which originally sees will have to be coloured. To this difficulty Aristotle replies that (i) 'to perceive by sight' is a wider expression than 'to see'; we perceive darkness by sight though we do not see it ; and (ii) that which sees *is* in a sense coloured, since the sense-organ receives the sensible object without its matter, i.e. becomes qualified by the same quality, and thus it is that perceptions and imaginations remain in the sense-organs when the objects have gone.

Aristotle's answer is in effect that it is by sight we perceive that we see, but by sight not qua sight but qua perception. This is one of the earliest passages of any author in which the difficulties involved in self-consciousness are discussed.[2] Aristotle does not assign all self-consciousness to a single central faculty. Knowledge, perception, opinion, and reasoning, while primarily engaged with objects other than themselves, each *in passing* apprehends itself. But elsewhere this reflexive activity is described as that which makes life valuable,[3] and the divine life is depicted as pure self-knowledge, 'knowing of knowing.'[4]

(4) Discrimination between the objects of two senses.[5] This, Aristotle argues, cannot be effected by one sense alone, nor by both acting separately. It must be the work of a single faculty, operating in a single moment,—a synthetic unity of apperception, as it was later to be called. Aristotle suggests that the

[1] 425 ^{b}12–25 ; *De Somno*, 455 ^{a}12–17 ; cf. 429 ^{b}26–29, 430 ^{a}2–9 on the self-knowledge of reason.

[2] Cf. Plato, *Charm.* 168 d, e.

[3] *E.N.* 1170 ^{a}25–^{b}10. [4] *Met.* 1074 ^{b}34. [5] 426 ^{b}12–427 ^{a}14.

synthesis is the work of a faculty which is one in place and number, but contains differences of aspect or operation. But, he points out, while one thing may be potentially black and white, it cannot be actually both at once, and therefore a single sense or organ cannot be qualified by whiteness and sweetness at once, which is a necessary precondition of its discriminating them. And he can only meet the objection by the analogy of the point, which is at once actually the beginning of one line and the end of another.

Elsewhere [1] he goes further and argues that the simultaneous perception of two qualities, whether of the same genus (white, black) or of different genera (white, sweet), involves the operation of the *sensus communis*.

(5) Aristotle argues that the inactivity of *all* the senses which is found in sleep cannot be a mere coincidence but must be due to the inactivity of the central perceptive faculty of which they are differentiations [2]—an inactivity for which he attempts to give physiological reasons [3] as well as a final cause.[4]

IMAGINATION

We now come to a faculty which is in Aristotle's view a sort of by-product of sensation, viz. 'imagination.' [5] *φαντασία* is in its original meaning closely related to *φαίνεσθαι*, 'to appear,' and stands for either the appearance of an object or the mental act which is to appearing as hearing is to sounding. To this usage belong the passages in which Aristotle speaks of *φαντασία* as being at work in the presence of the sensible object, as when he distinguishes it from opinion by pointing out that while the sun appears to be only a foot across we believe it to be larger than the inhabited world.[6] This apparently amounts to assigning to *φαντασία* the work, formerly assigned to sensation, of perceiving the common sensibles. And this interpretation is confirmed by a passage [7] in which he distinguishes between *φαντασία* with respect to the special sensibles, the incidentals, and the common sensibles, and points out that while in the first case *φαντασία* is infallible so long as the sensation is present, in the other two it is fallible even in the presence of

[1] *De Sensu*, 447 ^{b}17–448 ^{a}19, 448 ^{b}17–449 ^{a}20.
[2] *De Somno*, 454 ^{b}25–27, 455 ^{a}20–^{b}13.
[3] 455 ^{b}28–458 ^{a}25.
[4] 455 ^{b}14–28.
[5] 427 ^{b}27–429 ^{a}9.
[6] 428 ^{a}24–^{b}9; *De Somniis*, 458 ^{b}28, 460 ^{b}3–27.
[7] 428 ^{b}18–30.

the sensation. This amounts to throwing on to *φαντασία* the work of apprehending the incidentals and even the special sensibles as well as the common sensibles ; and sensation would accordingly be reduced to the level of a mere passive affection which has to be interpreted by *φαντασία* before it can give any information or misinformation about objects.

But for the most part Aristotle describes imagination in a way which involves no such reversal of his doctrine of sensation ; and it may be doubted whether the passages just referred to represent his deliberate view. Usually *φαντασία* is described as operating only after the sensible object has gone. The 'movement of the soul through the body' which perception is sets up a repercussion both in the body and in the soul—though as regards the soul the effect, until recollection takes place, is potential, i.e. not a conscious state of mind but an unconscious modification of the mind. At some later time, owing for instance to the suppression of sensation in sleep, the movement becomes actual, i.e. an image similar to but less lively than the sensation, and less trustworthy as a guide to objective fact, is formed and attended to ; and this is the act of imagination. The physiological condition of this is that the repercussion in the sense-organ has to be transmitted, with the blood, by the 'connate spirit' to the central sense-organ, the heart.[1]

The main functions of *φαντασία*, apart from the interpreting of present sensation, are :—(1) The formation of after-images, of which Aristotle notes both the positive and the negative kind.[2]

(2) Memory. Aristotle begins[3] by emphasising the reference of memory to the past, and infers that it is a function of the faculty by which we perceive time, i.e. of the 'primary faculty of perception,' the *sensus communis*. Memory, he adds, is impossible without an image. It is therefore a function of that part of the soul to which imagination belongs. But it is not the present image but the past event that is remembered ;

[1] *De Somniis*, 459 b7, 461 a3–8, 25–b15 ; *P.A.* 659 b17–19 ; *G.A.* 744 a3. For Aristotle's reasons for regarding the heart, not the brain, as the central sense-organ, cf. *De Somno*, 458 a15 ; *De Juv.* 467 b28 ff. ; *De Vita*, 469 a4–23 ; *De Resp.* 478 b33 f. ; *P.A.* 666 a14 ff. ; *G.A.* 781 a20 ff.

[2] *De Somniis*, 459 b5 ff.

[3] *De Mem.* 1. On Aristotle's theory of memory and recollection, cf. Bergemann in *Arch. f. Gesch. d. Phil.* VIII. 342–352.

how can this be? Aristotle's answer is that what is produced by perception in the soul is a sort of picture or impression of the percept, like the impression of a signet ring. Now in seeing a picture we may be said to become aware of its original; and similarly it is possible, in being aware of an image, to be aware of it as the image *of* something, and of something *past*. When these two conditions are fulfilled we have not mere imagination but the more complex act called memory. So much akin are the two operations, he points out, that it is possible to have a memory-image and yet suppose it to be a mere image, or to have a mere image and suppose it to be a memory-image.

From memory Aristotle proceeds to recollection,[1] which is distinguished both from continuous actual memory and from the re-learning of what has been completely forgotten. Recollection is the actualising, whether with or without effort, of memory which has become merely potential, i.e. has disappeared from consciousness. The principle on which recollection proceeds is that the movements left in our organs by perceptions tend to succeed each other in regular order. The association of ideas—for this it is of which we have here the earliest formulation—proceeds by similarity, by contrariety, or by contiguity; the recollection of an object tends to be succeeded by the recollection of what is like it or contrary to it or was contiguous to it in the original experience. And this principle, which operates in involuntary recollection, is the guide to be adopted in voluntary recollection. Aristotle proceeds to give an interesting detailed account of the process of recollection, and of the part played in it by the sense of distance in time.

(3) Dreams.[2] The fact that the content of dreams is sensuous, though the senses are themselves then inactive (for he does not recognise the contribution made to the fabric of dreams by *present* sensations), shows, Aristotle maintains, that dreams are the work of imagination, i.e. are a by-product of previous sensation. In the absence of stimulus from without, the mind is more free to attend to images, and at the same time more liable to be deceived by them, since (*a*) it has not the opportunity which it has in waking life of checking one sense by another, and (*b*) the critical faculty is in abeyance owing to the pressure of the blood on the heart, the central organ of perception. Thus in sleep we habitually take images for percepts, and to do this is to dream.

To his theory of dreams Aristotle adds an interesting dis-

[1] *De Mem.* 2.

[2] *De Somniis*, 1–3.

cussion of *Divination in Sleep*, in which he maintains an admirable balance between credulity and excessive scepticism.

(4) Imagination in relation to desire, and (5) imagination in relation to thought, will be best treated under desire and thought.

Movement

The four main functions originally recognised by Aristotle were nutrition, sensation, movement, thought.[1] We come now to the third of these.[2] Is movement originated by the whole soul or by some part, and if the latter, is it by a distinct part which has no other function? It is clearly not due to the *nutritive* faculty, for it is always directed to an end, and involves either imagination or desire, and is, besides, not possessed by plants. Nor is it due to the *sensitive* faculty, for many animals which have sensation are stationary. Nor is it due to *reason*, for reason, even when it thinks about something that should be avoided or pursued, does not necessarily prompt us to avoidance or pursuit, and when it does so, does not always do so effectively; desire seems necessary as well. Nor is it solely due to *desire*, for self-controlled people obey reason against desire.

Prima facie, then, the causes of movement are desire and practical thought (if we may count imagination as a form of thinking).[3] But thought and imagination set us in movement only if they have themselves been set in movement by the object of desire, so that there is really only one faculty that sets us in movement, viz. that of desire. Desire, however, is of two kinds, wish or rational desire, which desires the good, and appetite or irrational desire, which desires the apparent good. Or, to put the antithesis otherwise, wish is for future good, appetite for present pleasure mistaken for absolute pleasure and absolute good. We may distinguish four things involved in the movement of animals[4]—(1) the object aimed at, which moves without being moved, (2) the faculty of desire, which moves by being moved, (3) the animal, which is moved, (4) the bodily organ by which desire moves the animal, i.e. an organ which, while itself at rest (being 'moved' by desire only in the sense of being qualitatively changed), moves the

[1] 413 a23, b11–13. [2] III. 9. [3] III. 10.
[4] Cf. the analysis of nutrition, 416 b20–29.

adjacent parts by pushing or pulling. Aristotle illustrates this by the action of the joints, in which one of the contiguous surfaces is at rest, the other in rotatory movement, i.e. at the same time pushed and pulled [1]; but the ultimate organ which originates movement is for him the heart, which is the pivot of the whole body, the point at which body is actuated by soul.[2]

Desire is thus the cause of movement. But desire presupposes imagination of good or pleasure to be attained—imagination which may be calculative (i.e. deliberative) or merely sensitive.[3] In the latter case the animal acts on the vague 'imagination' as soon as it arises (and even the lowest animals have in this sense imagination and desire); in the former the imagined goods are measured against each other. There are three possibilities:—(1) unreasoning action from appetite, (2) alternate victory of appetite over wish and of wish over appetite (i.e. incontinence [4]), (3) action from the 'naturally higher' desire, viz. wish.[5]

Desire, then, and bodily movement may be regarded as secondary effects of sensation. The four main faculties are thus reduced to three—nutrition, sensation, thought. To the last we now proceed.[6]

THOUGHT

Thought is receptive of intelligible form, as sense was of sensible form.[7] It must have no positive form of its own, for this would hinder its being assimilated to its object; its only nature is that it is a capacity; it is nothing actually before it thinks. It must therefore be entirely independent of the body; if it were not, it would have a particular quality before it actually thought. It is the faculty by which we grasp essence, while sense is that by which we grasp essence-embodied-in-matter.

Two objections may be raised to this account. (1) If reason has nothing in common with any of its objects, how can it know—knowledge being a mode of being acted on? (2) If

[1] *Phys.* 244 ^{a}2; *M.A.* 698 ^{a}14–^{b}7. [2] *P.A.* 665 ^{a}10–15.
[3] 433 ^{b}29, 434 ^{a}5–10.
[4] More properly, in the language of the *Ethics*, alternate incontinence and continence.
[5] 434 ^{a}12–15. [6] III. 3–8. [7] III. 4.

reason is itself knowable, then (*a*) if it is so by its own specific nature, and the knowable is all one in species, other things that are known must be knowable through having an admixture of reason in them; while (*b*) if it is *not* by its own specific nature that it is knowable, it must have an admixture of the quality which makes other things knowable. The first difficulty Aristotle solves, like the similar difficulty about nutrition and sensation, by saying that reason is at first only potentially identical with its objects (as a wax tablet potentially contains what is later to be written in it), and becomes its objects actually only in knowing them. The second he answers by accepting in a sense the second alternative—by saying that the mind *is* knowable in the same way as its objects. In knowing immaterial forms, mind is one with its object; the whole mind is filled with the whole object, there being nothing in the object which mind cannot apprehend, and no part of the mind that is not occupied with the object; thus in knowing its object mind is knowing itself. Mind, then, has in it the same quality that makes other things knowable, but this is not an alien admixture but just the quality of being form without matter, which is mind's essential nature. We can thus reject the first alternative. External things have not mind in them, since they are concrete things in which forms are only implicitly present, while it is with pure forms that mind is potentially identical.

Thinking is divided into two main kinds.[1] There is (1) the thought of what is undivided, under which Aristotle considers (*a*) what is *actually undivided in quantity* though divisible, i.e. magnitudes within which we could distinguish parts if we chose. Until we do so choose, these are apprehended by a single act of mind in an undivided though divisible time. (*b*) What is *indivisible in kind*, an infima species, is also apprehended in an undivided time and by an undivided act of the soul. (*c*) What is *indivisible in magnitude*, e.g. a point, is known by an act of negation. The point is known simply as that which has neither length, breadth, nor depth, the line as that which has no breadth nor depth, the moment as that which has no duration, etc. From the apprehension of any of these kinds of undivided object—what we may call direct intuition—is distinguished (2) the other type of knowledge, the judgment, which unites two concepts and at the same time analyses a given whole into its two elements of subject and attribute. And as in sense we had the distinction between the infallible perception of the

[1] III 6.

special sensibles and the fallible perception of the common sensibles and the incidentals, so here Aristotle points out that while judgment is fallible, direct intuition—the apprehension of the essence of a single object—is not.

Aristotle proceeds to show how reason is related to imagination.[1] A thought is not an image, but we cannot think without images.[2] More definitely, 'the faculty of thought thinks the forms *in* the images.'[3] An image is a particular mental occurrence, just as much as is a sensation; *thought* first occurs when the mind discerns a point of identity between two or more images.[4] But even when a universal has thus been grasped, it is Aristotle's doctrine that imagery is still needed by the mind. 'The soul *never* thinks without an image.' Just as in geometrical proof, though we make no use of the particular size of the triangle, we draw one of a particular size, so in thought generally, if we are thinking of something non-quantitative, we yet imagine something quantitative, and if our object be something quantitative but indefinite, we imagine it as of a definite quantity. Nothing can be thought of except in connexion with a continuum, and nothing, however timeless, can be thought of except in connexion with time.[5] Aristotle seems here to be setting himself against Plato's view, expressed in the Divided Line,[6] that while scientific thought needs the aid of imagery, philosophical thought deals with pure forms without any such assistance. The use of imagery is the price, Aristotle maintains, which reason has to pay for its association with the lower mental faculties.

Active and Passive Reason

We must finally consider the culminating point of Aristotle's psychology. 'There must be,' he maintains,[7] 'within the soul a distinction answering to the general distinction between the matter which underlies each class of things and is potentially each of them, and the efficient cause which makes them—the

[1] III. 7, 8.
[2] 427 ᵇ14–16, 431 ᵃ16, 432 ᵃ7–14; *De Mem.* 449 ᵇ31.
[3] 431 ᵇ2.
[4] 434 ᵃ9, cf. *An. Post.* 100 ᵃ4–16; *Met.* 980 ᵇ28–981 ᵃ12.
[5] *De Mem.* 449 ᵇ30–450 ᵃ9.
[6] *Rep.* 510 b–511 d.
[7] iii. 5. Good accounts of the various interpretations may be seen in Hicks's ed. of the *De Anima,* lxiv.-lxix.; Adamson, *Development of Gk. Phil.* 249–254; Webb, *Studies in the Hist. of Nat. Theol.* 264–273.

distinction of which that between an art and its material is an instance.' Two points are here to be noticed. (1) The distinction between the active and the passive reason falls within the soul.[1] This is fatal to any interpretation which identifies the active reason with a divine reason falling entirely outside the individual human being. It is not fatal to the view that the active reason is a divine reason immanent in human souls. The chief difficulty to which such a view is exposed is that the only passage in which Aristotle deals explicitly with the divine nature—Book *Λ* of the *Metaphysics*—describes God in language which does not suggest immanence. (2) The active reason is not a reason which creates out of nothing. It works on a material given to it, which it promotes from potentiality into actuality.[2] What is meant by this we must try to see from the sequel. 'The one reason,' Aristotle proceeds, 'is analogous to matter because it becomes all things; the other is analogous to the efficient cause because it makes all things.' The first of these statements points to the ordinary action of apprehension. Just as the sensitive faculty becomes its objects in the sense that their form is conveyed over to the sensitive subject and becomes the whole nature, for the time being, of the sensitive subject, so in knowledge reason becomes identical with its objects. The act of apprehension is ascribed, then, to passive reason. What rôle is ascribed to active reason? In what sense does it make all things? Art makes its objects by making the material become them. And if the analogy is meant to be exact, the rôle of active reason must be to make passive reason become its objects by apprehending them. We shall see here an instance of Aristotle's general principle that 'what is potentially comes to be actually by the agency of something that already is actually.'[3] It is obvious that we come to know things which in the ordinary sense we did not know before. How, Aristotle asks himself, can this happen? Does not this transition from potential to actual knowledge imply that there is something in us that actually knows already, some element that is cut off from our ordinary consciousness so that we are

[1] *ἐν τῇ ψυχῇ* might conceivably mean only 'in the case of the soul.' But a temporary union of the two reasons within one personality is implied by *χωρισθεὶς* l. 22. So, too, Theophrastus says (ap. Them. 108, 23) *μεικτὸν γάρ πως ὁ νοῦς ἔκ τε τοῦ ποιητικοῦ καὶ τοῦ δυνάμει.*

[2] So Theophrastus describes active *νοῦς* as *ὁ κινῶν*, that which sets passive *νοῦς* to work (ap. Prisc. 29, 14, ap. Them. 108, 24).

[3] *Met.* 1049 ^{b}24.

not aware of this pre-existing knowledge, but which is nevertheless in some sort of communication with the ordinary consciousness or passive reason and leads this on to knowledge? And when Aristotle refers[1] to the moments in which we can live a life like that of God, he will (on this interpretation) be thinking of moments in which the partition between active and passive reason is broken down and we become aware of our oneness with the principle whose knowledge is always actual and always complete.

According to this line of thought, what the active reason acts on is the passive reason, which is a sort of plastic material on which active reason impresses the forms of knowable objects. But in the same sentence Aristotle introduces another line of thought, which seems to have been suggested by Plato's use of the sun as a symbol for the Idea of Good.[2] The one reason is analogous to matter by becoming all things, the other is analogous to the efficient cause by making all things, in the manner of a positive state like light; for in a sense light makes the potentially existing colours actually existing colours. Some of the conditions of colour are present in the dark, but to make actual seen colours a further condition is necessary, viz. light; and active reason is to the intelligible as light is to the visible. The analogy of light must not be pressed too closely. Active reason is not a medium between passive reason and its object; knowledge is a direct not a mediate relation, in Aristotle's view. But, though not a medium, active reason is a third thing, besides passive reason and the object, which has to be taken account of if we would understand the fact of knowledge, as light is a third thing, besides the eye and the object, which we must take account of if we would understand the fact of sight. Light is the condition of a medium which has been made actually transparent by the presence of an illuminant,[3] and it is its actuality that makes it possible for the eye which *can* see actually *to* see, and for the visible object actually to be seen. Similarly, the fact that active reason already knows all intelligible objects makes it possible for the passive reason, in itself a potentiality, actually to know, and for the knowable actually to be known.

'The active reason,' Aristotle continues, 'is separable and impassible and unmixed, being' (i.e. because it is) 'an actuality. For the active is always of higher worth than the passive, and

[1] *Met.* 1072 b14, 24; *E.N.* 1177 b26–1178 a8, 1178 b18–32.
[2] *Rep.* 507b–509d.
[3] 418 b12.

the originative source than the matter.' The meaning of 'separable' here is to be gathered from the occurrence later of the expression 'when it has been separated.' It means that the active reason, united for a time with the passive, can be separated from it; and the reference is clearly to the destruction, at death, of the latter and the survival of the former. Elsewhere [1] Aristotle speaks of 'reason,' simply, as surviving death, but that is where the distinction between active and passive reason is not present to his mind; when it *is* present he evidently thinks of the passive reason as being, like sense and imagination, an integral part of the soul which is the actuality of a particular body and cannot survive it. The other phrases used, in this sentence, of active reason emphasise the facts that it is entirely independent of the body and that it contains no unrealised potentialities but knows always what it ever knows.

'Actual knowledge,' Aristotle proceeds, 'is identical with its object; potential knowledge is prior in time in the individual, but in general it is not prior in time, but reason does not at one time function and at another not.' We have seen above that in some sense active reason is 'in the soul,' but we are not conscious of it, or are so only in moments of illumination; thus, in some sense, in the individual potential knowledge comes before actual knowledge. But 'on the whole' it does not; active reason knows actually when passive reason as yet knows only potentially. It is clearly implied that active reason, though it is in the soul, goes beyond the individual; we may fairly suppose Aristotle to mean that it is identical in all individuals.

'When it has been separated it is that only which it is essentially, and this alone is immortal and eternal (we do not remember, however, because this is impassible but the passive reason is perishable); and without this nothing knows.' Though active reason is always impassible, and unmixed, it is implied that its true nature is obscured during its association with the body, but exists in its purity when this association is over. Does this imply that the disembodied reason is conscious, as the embodied reason is not, of the full extent of its knowledge?

The perplexing remark 'we do not remember' receives some light from a passage earlier in the book, in which Aristotle is speaking of the influence of old age on the mental life.[2] 'Intuitive thought and contemplation, then, die away through the destruction of something else within (the body), but are them-

[1] *Met.* 1070 ^{a}26. [2] 408 ^{b}24–30.

selves impassible. But reasoning, and loving or hating, are affections not of reason but of its possessor, in so far as he possesses it. Hence when he perishes there is neither memory nor love ; for these belonged not to reason but to the composite being which has perished ; reason is doubtless something more divine and is impassible.' In the light of that passage it seems clear that Aristotle here means that memory does not survive death. The ground is that (1) active reason is impassible ; it takes no impress from the circumstances of life ; its knowledge has therefore no marks of date or circumstance : while (2) the passive reason which does take the impress of circumstances has perished at the death of the individual.

The last words of the chapter are capable of a variety of interpretations, viz. :

(1) 'and without the passive reason the active reason knows nothing.'

(2) 'and without the active reason the passive reason knows nothing.'

(3) 'and without the passive reason nothing knows.'

(4) 'and without the active reason nothing knows.'

It can be easily seen that on none of these interpretations do these words properly form part of the ground for our 'not remembering.' They simply sum up the teaching of the chapter by saying 'and without the active reason nothing knows.'

Alexander identifies the active reason with God, and this view is adopted by Zabarella, whose argument [1] may be summarised as follows : 'The active reason is clearly stated to exist entirely apart from matter.[2] Now in *Metaphysics Λ*, the only place where Aristotle discusses deliberately what pure immaterial forms there are, the only such forms that he recognises are God and the intelligences. The active reason cannot be any of these inferior beings, for these have, apparently, the sole function of moving their respective spheres. The active reason, then, must be God, who as the 'primary intelligible' [3] is the source of intelligibility in all other intelligibles. It is God, then, as active reason, that makes the potential object of knowledge an actual object of knowledge, and at the same time enables the passive reason, which in itself has only the potentiality of knowledge, actually to know, just as the light of the sun causes the potentially visible to be actually visible and the potentially seeing eye actually to see.'

[1] *De Reb. Nat.*, De mente agente, capp. 12, 13.
[2] *De An.* 430 a17. [3] *Met.* 1072 a26–32.

Zabarella's opinion is always worthy of the most serious attention. But it would seem that in his zeal to get a perfect agreement between the *De Anima* and the *Metaphysics* he has put a somewhat unnatural interpretation on the former work. The active reason is distinctly presented there as existing in the human soul. And *χωριστός*, which he takes to mean 'separate,' more probably means 'separable'; the mode of being of active reason during the life of the individual seems to be contrasted with its state when it exists *χωρισθείς*, after the death of the individual. Further, it is difficult to suppose with Zabarella that it is in its character as *νοητόν* rather than as *νοῶν* that it is represented as making the individual's knowledge possible.

A representation of God in the *De Anima* as immanent in the individual would not necessarily be inconsistent with the representation of Him in the *Metaphysics* as transcendent. But a description of Him as having all our knowledge before we have it, and imparting it to us, would be inconsistent with the description of Him in *Λ* as knowing only Himself. It is possible that the two books represent divergent modes of Aristotle's thought about the Deity. But it is not necessary to suppose this. Aristotle makes no actual mention of God in this passage of the *De Anima*, and though the pure never-ceasing activity of thought here described is in some respects like that ascribed to God in the *Metaphysics*, Aristotle probably did not identify the two. It is more probable that he believed in a hierarchy reaching continuously from the lowest beings, those most immersed in matter, up to man, the heavenly bodies, the intelligences, and God; the active reason in man being one of the highest members of this hierarchy but having others as well as God above it. This is the interpretation of the *De Anima* to which the purely deistic doctrine of the *Metaphysics* points.

CHAPTER VI

METAPHYSICS

THE motive which inspires Aristotle throughout the *Metaphysics* is the wish to acquire that form of knowledge which is most worthy of the name of wisdom. The desire to know, he points out, is innate in man. It is seen, at the lowest level, in the delight we take in the use of our senses. The first stage above this in the direction of completer knowledge is that involved in the use of memory, which distinguishes us from the lowest animals. The next stage—and one to which only man attains—is 'experience,' whereby through the coalescence of many memories of the same kind of object (e.g. of what helped Callias and Socrates and others when ill of a certain disease) we acquire, without knowing the reasons for it, a rule of practice. One stage higher is 'art,' the knowledge of practical rules resting on general principles. Highest of all comes 'science,' the pure knowledge of causes; this is highest because it is not, like art, limited in its interest by having some ulterior practical end, but is knowing for knowing's sake. This is the last and highest product of civilisation.[1]

'Wisdom' must be not only science or knowledge of causes, but knowledge of the first and most universal causes. For this satisfies most completely the criteria of wisdom we should naturally use. It is the most comprehensive knowledge; the knowledge of what is hardest to know, since its objects, being the most universal, are the farthest from sense; the most precise knowledge, since its objects are the most abstract, the least complex; the most instructive; the most self-contained or independent; and the most authoritative, since it will be *inter alia* knowledge of the final cause of all things. Philosophy springs from primitive wonder, and moves towards the abolition of wonder, towards understanding the world so well through

[1] *Met.* A. 1.

and through that no room is left for wonder at things being as they are.[1]

Aristotle has enumerated in the *Physics* what he regards as the first causes—the material, the formal, the efficient, and the final cause. He proceeds to test the accuracy of his analysis by considering whether previous philosophers have detected any causes other than these. Into the framework of this enquiry he fits the whole account of earlier philosophy which fills the remainder of Book *A*. His conclusion, as might be anticipated, is that no earlier thinker has discovered any cause other than the four, while all the four have been treated of, though only in a 'vague' or 'stammering' way.[2]

In Book *B* Aristotle proceeds to state the main problems which the would-be philosopher must face. Metaphysics remains for Aristotle throughout, more completely than any other department of thought, a matter of 'problems' or 'difficulties.'[3] There are certain points on which he has made up his mind, but there is on the whole no dogmatic system but a series of essays at the discovery of truth in a region which he feels to be full of obscurity. Books *Γ*, *E–I*, *MN* may be said to have the problems of Book *B* fairly definitely in mind, and occasional references backward[4] emphasize the connexion. *Λ* is an independent treatise, but incidentally supplies Aristotle's answer to some of the problems. Only *Δ* and *K* stand outside the scheme.[5]

Two main questions occupy Aristotle's mind.[6] (1) Is a single supreme science of metaphysics possible—a synoptic science which shall study the nature not of this or that reality but of the real as such, and deduce the detailed nature of the universe from some central principle? His answer, to be gathered mainly from *Γ* and *E* with the aid of the *Posterior Analytics*, is that a science of metaphysics is possible. All that is has a certain nature that belongs to it simply as being, and this can be known. There are certain principles that are true of everything that is, and that lie at the basis of all demonstration—the laws of contradiction and of excluded middle. But metaphysics cannot deduce the detail of reality from these or any other central principles. There are distinct kinds of reality with natures of their own, and with first principles which are

[1] A. 2. [2] A. 10. [3] ἀπορίαι.

[4] Γ. 1004 ᵃ33, I. 1053 ᵇ10, M. 1076 ᵃ39, ᵇ39, 1086 ᵃ34(?), ᵇ15.

[5] Cf. p. 13 f.

[6] There are in all some 15 problems, which are propounded in B. 1 and discussed dialectically in B. 2–6.

not deduced but are grasped directly no less than the universal first principles. Nor is the essential nature of reality manifested fully and equally in all that is. Being is not an attribute that belongs in precisely the same sense to everything that is. There is one kind of being which *is* in the strictest and fullest sense—viz. substance; and all other things *are* simply by virtue of standing in some definite relation to substance—as qualities of substance, relations between substances, or the like. And what is true of being is true of unity; whatever is is one, and whatever is one is, and unity has different though connected meanings according as it is unity of substance, of quality, of quantity, etc.[1] 'Being' and 'unity' are terms standing above the distinction of categories and applicable in every category.[2] To these we must add 'good'; but 'good' is not on quite the same footing. It is applicable in every category,[3] but not to everything that is; Aristotle's view is rather that 'good and evil' is an opposition which may be found within each category. It was from such indications as these that the schoolmen developed the doctrine of the '*transcendentia*'—*ens, unum, verum, bonum, res, aliquid.* But this list, though based on hints in Aristotle, has no Aristotelian authority.

There are three orders of entity—those which have separate substantial existence but are subject to change, those which are free from change but exist only as distinguishable aspects of concrete realities, and those which both have separate existence and are free from change. These are studied by three distinct sciences—physics, mathematics, and theology or metaphysics.[4] Physics and mathematics again can be subdivided; mathematics, for instance, into the main branches arithmetic and geometry, and various applications of these. And while there are principles common to all mathematics (e.g. that equals taken from equals leave equals), there are also principles proper to arithmetic and others proper to geometry.

Two views of the subject-matter of metaphysics may, Aristotle points out, be held; it may be doubted whether first philosophy is universal in its scope or deals with one particular kind of reality. But the two views are reconcilable; if there is any unchangeable substance, the study of it will be first philosophy, and universal just because it is first.[5] In studying

[1] These form the subject of *Met.* I.
[2] *Γ.* 1, 2.
[3] *E. N.* 1096 ᵃ19.
[4] *Met.* E. 1.
[5] *Ib.*

the primary kind of being, metaphysics studies being as such. The true nature of being is exhibited not in that which can exist only as an element in a concrete whole, nor in that which is infected by potentiality and change, but only in that which is both substantial and unchangeable.

The restriction of metaphysics to the study of one department of being (and of others only as owing their being to this) recurs in Book *Λ*. Its subject-matter is there first restricted to substance, as the 'first part' of the universe. Next substance is divided, not as in E into two kinds, the changeable and the unchangeable, but into three—the eternal sensible (the heavenly bodies), the perishable sensible, and the insensible. The two former are said to be the subject of physics,[1] and accordingly chs. 2–5, which deal with sensible substance, must be regarded as preliminary to chs. 6–10, which deal with insensible substance. Not only *Λ*. 2–5, however, but the greater part of *Z–Θ* deals with the principles involved in sensible substance, and would have to be regarded as merely preliminary to the business of metaphysics, were it not that form, the principle mainly discussed in these books, is also that which exists separate and unchangeable in God and in the 'intelligences' that move the planetary spheres. It cannot be said that in practice the distinction between physics and metaphysics is well maintained by Aristotle, and it may be noted that the bulk of the *Physics* is what we should call metaphysics. It is not an inductive enquiry into natural law, but an *a priori* analysis of material things and of the events that befall them.

(2) The second main question in Aristotle's mind has already been touched on by anticipation. It is the question whether there are non-sensible as well as sensible substances, and if so, what they are. Are universals, as Plato claimed in his ideal theory, self-subsistent substantial entities? In particular, are the widest universals, being and unity, substances? Again, are the objects of mathematics substances? The last three questions Aristotle answers with a firm negative. The polemic against the Platonic Forms, i.e. against the substantiality of universals, is one of the leading notes of the *Metaphysics*, to which Aristotle returns again and again. It would be tedious to follow this polemic into its details; parts of it are unworthy cavils and others are most suitably regarded as jokes. The main point is this:—The world which is given to us in experience is a world of concrete individual things acting

[1] 1069 a36.

and reacting on each other. In contemplating these we become aware of characters common to many individuals. These are for Aristotle as real, as objective, as the individuals. They are not in any sense the work of the mind, any more than are the Forms to Plato. But he warns us to assign to them only that mode of existence which is proper to universals, viz. existence as characteristic of individuals. We must not posit a separate world of universals. And we must not suppose that we can explain the world, which is a world of change, by the operation of mere universals. The form of man is in a sense what operates in the birth of each individual man, but it is the form of man as embodied in his father. The form of house operates in the production of each house, but it is the form of house as apprehended by an individual builder.

It may be doubted whether Plato thus 'separated' the universal from its particulars. To distinguish the universal from its particulars is in a sense to separate it. It is to think of it as a *distinct* entity. Whether Plato also thought of it as a *separately existing* entity, it is hard to say. Much of his language lends itself to the charge, but it is possible that he may only be putting in an emphatic and picturesque way the doctrine that particulars always imply a universal. Yet it is hard to suppose that Aristotle could have so thoroughly misinterpreted a master with whom he was presumably for years in constant contact, as to take for a fundamental difference of view what was really only a difference of emphasis and expression.

Aristotle further ascribes to Plato a belief in the existence of mathematical objects as something 'intermediate' between Ideas and particulars.[1] Aristotle's own conception of the objects of geometry itself assigns to them an intermediate position, though not as a class of separate entities between two other classes of separate entities. According to him, they are sensible things considered in abstraction from their sensible qualities. Consider sensible things simply as having boundaries of a certain shape, and you are considering the objects of geometry.[2] But a further abstraction is possible. Not only may you think away the 'sensible matter' of sensible things, but you may think away the 'intelligible matter,' the extension,[3] of geometrical objects, and you then come to the essence of the straight line, the circle, etc., viz. the principle on which it is constructed. But, Aristotle would say, it makes all the difference between

[1] A. 987 b14. [2] M. 2, 3. [3] Z. 1036 a11.

his own and the Platonic view that he assigns no separate existence to either the intermediate or the final result of abstraction, while the Platonists assign it to both. The merits of the controversy thus turn on the same point which arose with regard to the discussion of the Forms, viz. whether the Platonists meant by their 'separation' the recognition of a factual separateness or only that of a cognizable difference between the things 'separated.'

Though Aristotle denies that either universals or mathematical objects are substances, he holds that there are non-sensible substances. There is in the first place God, the unmoved mover of the universe,[1] and in the second place the intelligences which, moved by God, move the planetary spheres.[2] And thirdly he indicates that the human reason (or the 'active' element in it) is, on the death of the individual, capable of existing apart from any body.[3]

The First Principles of Demonstration

Having stated that metaphysics will study the first principles of demonstration, Aristotle proceeds[4] to establish the two main principles that underlie all demonstration, the 'common first principles' of the *Posterior Analytics*—the law of contradiction and that of excluded middle. The former is first expressed in the form 'the same attribute cannot belong and not belong to the same thing at the same time and in the same respect.' This is, it will be observed, stated quite objectively as a law of being. But from it follows a psychological law; to think that the same attribute does and does not belong to the same thing at the same time in the same respect would be to be oneself oppositely qualified at the same time in the same respect, and is therefore impossible.[5]

Aristotle rightly makes no attempt to prove the law. To demand a proof of it is, he says, to betray one's want of training in logic. To demand a proof of *everything* is to demand a regress which must be infinite; and a demand which from the nature of the case cannot be satisfied should not be made. And if *something* must be known without proof, what is there fitter to be so known than the law of contradiction, a law which, as

[1] *Λ.* 7. [2] *Λ.* 8.
[3] *Λ.* 1070 a24–26.; *De An.* III. 5.
[4] *Γ.* 3–8. [5] *Γ.* 3.

we have seen, it is impossible to doubt in thought, though we may deny it in words? What we may do by way of commending the law is (1) to refute those who deny it by showing that in denying it they are assuming its truth, and (2) to show the insufficiency of the reasons which lead to its denial.[1]

(1) Our opponent must be prepared to say something; if he refuses to do this, we cannot be expected to convince him, any more than we could be expected to convince a vegetable. We need not demand that he shall make a statement; we need only ask him to utter a single word, e.g. 'man.' If he says this he evidently means something by it, and some one thing. He is already implying that 'being man' is something definite and is not also 'not being man,' and therefore that that which is a man is not also, in the same sense of 'man,' not a man. He is thus admitting the truth of the law of contradiction. A consistent scepticism must be speechless.[2] Again, to deny the law is to obliterate all the distinctions in the universe. If a man is also not a man, he is *a fortiori* (since there is more opposition between 'man' and 'not man' than between 'man' and 'not ship') not a ship, and therefore (if the law is not true) *is* a ship, and similarly is everything else whatever.[3]

The denial of the law must be either total or partial. If partial, the law is admitted to hold good in certain cases. If total, then either (*a*) whatever can be affirmed can be denied and whatever can be denied can be affirmed, or (*b*) whatever can be affirmed can be denied, but not everything that can be denied can be affirmed. But the latter alternative implies that something definitely is not, and its opposite definitely is; i.e. the law is admitted to hold good in some cases. And if our opponent adopts the former alternative, he is saying that nothing has any definite nature, i.e. that nothing is. He is saying that all statements are true and that all (including his own denial of the law) are false. He is saying nothing definite, and we cannot be expected to argue with him.[4]

Men's actions show that they do not think thus. If the same thing is man and not man, on the same principle the same thing is good for a man and not good for him. But no one, if he

[1] I have space only to indicate some of the more salient points of the complicated argument which follows. A full discussion of it will be found in Maier, *Syll. d. Arist.* I. 41–101.

[2] 1006 ^{a}11–^{b}34. [3] 1007 ^{b}18–1008 ^{a}2.

[4] 1008 ^{a}7–^{b}2.

thinks he ought to do something, proceeds not to do it, on the ground that he also ought not to do it.[1]

(2) The denial of the law stands or falls with the Protagorean dictum that whenever A appears to be B it is B. Those who deny the law on the ground of a real difficulty they have experienced in thinking out the nature of the world (as distinguished from those who deny it merely for argument's sake), do so because of their observation that in the course of nature contraries can issue from the same thing. They argue that since *ex nihilo nihil fit*, the thing must have had contrary attributes. This is to be refuted (*a*) by the distinction of potentiality and actuality—the same thing may potentially but cannot actually have opposite attributes; and (*b*) by pointing out that there is another kind of substance which is entirely free from potentiality and change.[2]

Similarly the belief in the truth of appearances comes, for some people, from observation of sensible things. They note that the same thing seems to some people sweet, to others bitter, and they see that the truth cannot be determined by a mere counting of heads. They note that the same thing seems sensibly different to the same man at different times, and they think the one sensation cannot be any truer than the other.[3]

The cause of the error lies in the identification of sensible things, in which there is a large element of the variable, with the whole of reality. These thinkers see that sensible things are always changing, and infer that nothing can be said truly about them; they forget that that which is losing a quality still has some of what it is losing, and that of that which is coming to be some part must already be. They forget that things which change in quantity may be stable in quality. They forget that the sublunary world of change is only a small part even of the physical universe. They forget that besides the physical universe there are things that do not change.[4]

We must point out that even if sensation of the 'special' qualities peculiar to each sense is infallible, 'imagination,' which is involved in all the other operations of sense, is not. We must ask these thinkers if they really doubt whether sizes and colours are such as they appear at a distance or near at hand, to the sick or to the healthy, the sleeping or the waking, the specialist or the layman. Their actions show that they do not. Further,

[1] 1008 b12–27.
[2] 1009 a6–38.
[3] 1009 a38–b11.
[4] 1010 a1–b1.

no sense gives opposite information at the same time about its proper object. Nor does it even at different times give opposite deliverances about the sensible quality, but only about the object that has it. The same wine may, if either it or the body of the percipient changes, seem at one time sweet and at another not, but sweetness does not change; that which is to be sweet must always fulfil the same conditions. The apparent self-contradiction of sensation disappears if we draw the necessary distinctions; the same thing does not appear different to the same sense, in the same respect, under the same conditions, at the same time. We may admit that without percipient beings there will be neither sensible qualities nor sensations, but the objects which stimulate perception must be independent of the perception. If nothing is but thinking makes it so, the *esse* of man himself will lie in being thought to be a man, and cannot therefore lie in thinking; his *esse* will be *percipi*, not—as everyone knows it to be—*percipere*.[1]

It will be seen that, starting from a discussion of the law of contradiction, Aristotle has been led to an attack on sensationalism or subjective idealism. His position is as follows:—Sense-perception proper, free from any admixture of association and interpretation, is infallible. It is the awareness of something (an *αἰσθητόν*) which is distinct from the awareness, and is a concomitant (*πάθος*) [2] of an object (*ὑποκείμενον*). Each such sensum has a character of its own distinct from that of its opposite. 'Sweet,' for example, stands for a certain definite kind of sensum. Any sensum, whenever experienced, must have this character if it is to be designated 'sweet,' and cannot be designated as 'bitter' if it has this character. Sense does not contradict itself about the sensum. Thus as regards sense, there is no reason to doubt the law of contradiction.

The sensum, though distinct from the sensation (*αἴσθησις* or *αἴσθημα*), is dependent upon the perceiver. It is in fact a resultant of the meeting of a certain object and a certain percipient subject. If either the object or the percipient's body undergoes certain changes a different sensum is produced. Thus again, even when we take into account the physical object there is no reason to doubt the law of contradiction; the fact that I now call sweet an object which before I called bitter only shows that either the object or something in my body has changed.[3] And the fact that both the sensation and the sensum are relative to a percipient, and could not exist if

[1] 1010 b1–1011 b12. [2] 1010 b20 f. [3] *Ib.* 19–26.

there were no percipients, by no means proves that there is nothing that is not relative to a percipient—that 'man is measure of all things.' For perception does not arise by our own volition. It is stimulated by something or other, and this must be something independent of that which it stimulates. And if it be said that 'stimulator' and 'stimulated' or 'perceived' and 'perceiver' are terms relative to one another, that does not show that that which stimulates and is perceived has not a nature of its own independent of its stimulating and being perceived.[1]

There is a further element in Aristotle's view. There are certain conditions which are favourable to the perception of objects as they really are, viz. nearness to the object, a healthy state of body, and the waking condition.[2] This if pressed seems to imply that there is not only the sensum red or sweet, for example, but also corresponding qualities belonging to physical objects, and that under favourable conditions of perception we apprehend a sensum when the object has the corresponding quality, while under unfavourable conditions we perceive, say, the sensum bitter when the object has the quality sweet.[3] But it may be doubted whether Aristotle held a theory so complicated as this, and whether he had worked out completely the implications of what he says. With regard to heat and cold, no doubt, his theory implies that apart from sensible heat and cold there must be a heat and cold which are entirely objective; for the formation of all complex bodies, including the sense-organs, is ascribed to the operation of heat and cold. And he does in fact distinguish between physical and sensible heat.[4] But he would hardly have drawn a similar distinction in the case, say, of colour or of odour.

The argument here summarised contains in principle almost all that can or need be said in refutation either of complete scepticism or of sensationalism. The argument for the law of contradiction is not at all points free from the charge of circularity, but in the main Aristotle confines himself to the proper method, that of showing that the very denial of the law of contradiction implies its assertion. The argument for the law of excluded middle [5] follows similar lines.

[1] 1010 ᵇ30–1011 ᵃ2. [2] 1010 ᵇ3–11.
[3] Θ. 1047 ᵃ4–7 also implies that secondary qualities (heat, sweetness) belong to objects independently of sensation.
[4] *P.A.* 648 ᵇ12–649 ᵇ7. [5] *Γ*. 7.

Further Determination of the Subject of Metaphysics

Book *E*, having shown that the study of separate unchangeable being is the study of being as such, proceeds to rule out certain senses of 'being' as irrelevant to metaphysics, viz. (1) accidental or incidental being,[1] and (2) being as truth.[2] (1) Accidental being is not studied by metaphysics because it cannot be studied at all. A house, for example, has an indefinite number of accidental attributes. Science cannot embark upon the study of this indefinite series of attributes; the science of building, for instance, concentrates on the building of a house which shall be what a house essentially is, a 'shelter for living things and goods,'[3] and ignores its incidental attributes. Similarly, geometry studies not any and every attribute of the triangle, but only those which belong to it *qua* triangle. And metaphysics will not study those connexions of subject and attribute in which the attribute does not flow from the nature of the subject but is incidental to it. It does not study these, because they are not objects of knowledge at all. Two possibilities seem to be contemplated by Aristotle. (*a*) The accidental, the exception to law, may have a law of its own. If *A* is usually *B*, there may be a law that under certain conditions *A* is always or usually not-*B*.[4] If this law is discovered, the apparent accident is found to be no accident, so that still there is no knowledge of the accidental. But (*b*) in human action, and perhaps in some other cases as well, Aristotle recognises a real contingency which can never become an object of knowledge.[5] If a man behaves in a certain way he is bound to meet a violent death, but there is nothing from which it necessarily follows that he will behave in that way, and until he does so it is not determined whether he will die by violence.[6]

(2) The other sense of being in which it is not studied by metaphysics is 'being as truth.' This is excluded because it belongs not to objects but to states of mind, and is therefore studied not by metaphysics but by logic.[7] Aristotle admits, indeed, the notion of 'false things,' and presumably therefore that of 'true things.' But either (*a*) a 'false thing' means a non-existent thing, and a true thing an existent one, in which

[1] *E.* 2, 3.
[2] *E.* 4.
[3] *H.* 1043 ^{a}16.
[4] *E.* 1027 ^{a}25.
[5] Cf. pp. 80 f., 188, 201.
[6] 1027 ^{a}32–^{b}14.
[7] 'Being as truth' is, however, discussed in *Θ.* 10, which is out of place in the *Metaphysics*.

case 'false' and 'true' are not being used in their proper sense, and we have to do not with 'being as truth' but with being as existence. Or (*b*) a false thing is one which produces the appearance of something that is not there, as does a scene-painting or a dream.[1] These are presumably subjects not for metaphysics but for psychology.

Two main senses of being remain—the being of which the categories are a classification, and potential and actual being. Of these the former is studied in *ZH*, the latter in *Θ*.

SUBSTANCE

Aristotle does not offer in the *Metaphysics* any treatment of the categories as a whole. The categories other than substance are, as it were, mere 'offshoots and concomitants of being.'[2] Substance is prior to them in three ways[3] :—(1) 'because it can exist apart while they cannot.' This does not mean that it can exist without them while they cannot exist without it. A qualityless substance is as impossible as a quality which does not presuppose a substance. The substance is the whole thing, including the qualities, relations, etc., which form its essence, and this can exist apart. It implies qualities but these are not something outside it which it needs in addition to itself. A quality on the other hand is an abstraction which can exist only in a substance. Obviously, if this is his meaning, Aristotle is thinking of substance as the *individual thing*. Secondary substances (i.e. genera and species), being universals, cannot according to his own doctrine exist apart, but must be supplemented by the special qualities of their individual members.

(2) Substance is prior in definition. In defining a member of any other category you must include the definition of the underlying substance. Aristotle implies that in defining a substance you need not include the definition of anything in any other category; but this is not true, since every differentia of a substance is a quality.

(3) Substance is prior for knowledge. We know a thing better when we know what it is than when we know what quality, quantity, or place it has. Indeed, if we want to know something that belongs to a category other than substance, we must ask not what qualities, etc., it has, but what it is, what is

[1] *Δ*. 1024 ^{b}17–26.
[2] Said of relation in *E.N.* 1096 ^{a}21.
[3] *Z*. 1028 ^{a}32–^{b}2.

its quasi-substance, that which makes it what it is. In *this* argument substance is evidently being thought of not as the concrete thing but as the *essential nature*. And this double meaning pervades Aristotle's whole treatment of substance.

The existence of substance, and the distinction between it and the other categories, is for Aristotle self-evident. The primary meaning of substance is 'that which is not asserted of a subject but of which everything else is asserted.' There are terms which can figure either as subjects or as predicates; e.g. we can say 'white is a colour,' and we can say 'the log is white.' There are others which, according to him, can only figure as subjects. 'The white (thing) is a log' is not a proper but an accidental predication.[1] This logical doctrine seems to be a mistaken one.[2] But though the logical doctrine be untrue, the metaphysical distinction between substance and the non-substantial is correct. Reflection on a statement like 'Socrates is pale' shows that it is not paleness, nor any of the qualities combined with it in Socrates, nor the sum of these qualities with paleness, that is said to be pale, but something which *has* all these qualities, the individual thing which is the substratum of them and in which they are united. This is undoubtedly the view of the 'plain man.' It is still debated by philosophers whether substance implies over and above a sum of qualities an 'unknown somewhat' which is their substratum. Aristotle sides with the plain man. A substance is for him (if we leave out of account God and the other 'pure forms') a unity involving not only qualities but also a surd or unknown element which he calls matter or substratum. And in particular the fact of change drives him to distinguish between quality and substance. A quality cannot change. It is what it is and cannot become anything else; it can only be succeeded by another quality. If there is such a thing as change, as distinct from bare succession, there must be substance as distinct from qualities. But Aristotle is not content to leave the matter at that, to insist on the difference between individual things and their qualities and relations (though this is one of the main moments of his thought, especially in his opposition to Platonism); he proceeds to enquire what it is in individual substances that makes them substances—whether it is matter,

[1] *An. Post.* 83 a1–17.

[2] It seems to be due to a failure to distinguish completely the logical relation of subject-predicate from the metaphysical relation of substance-attribute.

or form (or essence). This opposition, and that of potentiality to actuality, form the leading features of Aristotle's metaphysics. The two antitheses are closely connected, but, broadly speaking, in the one the world is being regarded statically, as it is at a moment of its history, and in the other dynamically, as in process of change.

Matter and Form

The world presents itself to Aristotle as a hierarchy the highest members of which are pure forms, while all other actually existing things are complexes in which form is embedded, so to say, in more or fewer layers of matter, or in which matter is moulded into more and more complex forms. Each of these ways of looking at the question demands some attention. (1) If we start with a concrete terrestrial object, say a living body, we find that it is capable of change in four respects. It can move in space; it can change in quality; it can become larger or smaller; it can be destroyed (and has been generated). Matter (*ὕλη*) being for Aristotle that which is presupposed by change, a thing that can change in all four ways is regarded as embedded, as it were, in four layers of matter—'local matter' or matter for locomotion, matter for alteration, for change of size, for coming into being and passing away. These have a definite logical order; the second presupposes the first,[1] the third the second.[2] The fourth and third imply one another.[3] The three last are *in fact* always found together; they belong to all sublunary bodies. 'Local matter,' however, is not only logically independent of the other three, but can exist apart from them, and does so exist in the heavenly spheres, which accordingly are 'more divine' than terrestrial things.[4] Every individual thing in the world except the pure forms is a union of form with at least 'local matter.' But a still more attenuated kind of matter may be distinguished by thought though it never exists without 'sensible matter,' i.e. without, at least, local matter. This is 'intelligible matter'[5] —in other words, spatial extension. The recognition of this comes late in Aristotle's thought and is confined, so far as explicit mention goes, to the *Metaphysics*. From any sensible

[1] *Phys.* 260 ᵇ4. [2] 260 ᵃ29.
[3] *H.* 1042 ᵇ3; *De Gen. et Corr.* I. 5.
[4] *H.* 1044 ᵇ7; *Θ.* 1050 ᵇ21; *Phys.* 260 ᵃ28.
[5] *Z.* 1036 ᵃ9, 1037 ᵃ4. Cf. *K.* 1059 ᵇ15.

thing you may think away its whole sensible matter. In the case of terrestrial things you can abstract from their possession of the 'prime contrarieties' heat and cold, dryness and fluidity, and of all the consequential qualities; in the case of celestial things you may abstract from their capacity for rotation; both alike will still have shape and size. You will have passed by abstraction from actual bodies to the objects of mathematics. You can think first of these bodies simply as three-dimensional objects and nothing more. You can then consider the plane sections of these solids apart from the third dimension from which they are in fact inseparable. Similarly you can consider apart the linear sections of these planes, though these again have no separate existence.[1] Though you have now abstracted from all that would in ordinary language be called matter, you have not yet come to pure form. For a particular straight line or plane or solid is distinguished from the form of straight line or surface or solid (which some Platonists naïvely identified with the numbers 2, 3, 4 respectively,[2] and which modern mathematics with greater accuracy represents by equations) by being embodied in a particular extension. Abstract from this 'intelligible matter,' and nothing but pure form is left.

Plato had treated space as the material element or substratum of sensible things, the stuff out of which they are moulded by the entrance into it of shapes which are likenesses of the eternal existents, the Forms.[3] For Aristotle extension, though involved in sensible things, is not the stuff of which they are made. That is something which answers more to our ordinary notion of matter, something that has movement as well as extension. And the matter of sublunary things has in addition the capacity for the other three modes of change.

(2) Again we may start from the other end, with 'prime matter'—an expression, it may be noted, which is very rare in Aristotle, though his followers have rightly regarded it as one of the most important implications of his system. Prime matter nowhere exists apart. It is only an element in the nature of individual things concrete of matter and form. It exists only in union with one of the 'prime contrarieties' heat and cold, and with one of the other prime contrarieties dryness or fluidity. The least complex terrestrial bodies are already either earth, water, air, or fire. These four 'simple

[1] *M.* 1077 ᵇ17–30.
[2] *De An.* 404 ᵇ18–25, 429 ᵇ18–20; H. 1043 ᵃ33.
[3] *Tim.* 50 c, 52 a.

bodies' in their turn are the material out of which the 'completely mixed' or homoeomerous bodies are formed. Minerals are, in general, homoeomerous bodies, and so are the simplest, least organised parts of plants and animals, viz. the tissues. These furnish the material for other parts of plants and of animals which are organised for higher functions—to minister e.g. to sensation or to locomotion. These are the anomoeomerous parts, or organs. As the tissues are material for the organs, the organs are themselves material for the whole living body, which is a yet more complex unity, a unity more completely formed than the organs, as these are more completely formed than the tissues and the tissues than the 'simple bodies.'[1] Finally in man, the most highly organised or formed of the animals, there is superadded a form which is not the principle of structure of the body or of any part of it, uses no bodily organ, and can survive the body. This is the reason, or, more precisely the active reason—that mysterious entity which supports the thinking of the passive reason. One stage higher come the intelligences which move the planetary spheres—pure forms not united with body at all, but operating on their respective spheres *ab extra*. And highest of all is the supreme pure form which is God.

Every substance in the universe is individual; the universal is always for Aristotle something which though perfectly real and objective has no *separate* existence. The pure forms as well as the substances concrete of matter and form are individual. But difficulties arise here. (1) In concrete substances Aristotle finds the 'principle of individuation' in matter. Usually, at least, he represents the form of each *infima species* as being identical in every member of the species, so that it cannot serve to mark off one individual from another, and it is matter that is said to do so.[2] On what, then, is the individuality of the pure forms based? It can only rest on a difference of *form*, and the schoolmen drew the logical conclusion when they treated God and the intelligences as sole members of separate *infimae species*. But this hardly meets the difficulty. Though a species may in fact have only one member, the nature of a species is to be capable of having more than one. How then is each of the intelligences distinguished from the thinkable though non-existent members of the same

[1] *Z*. 1040 ^{b}5–16.

[2] *Δ*. 1016 ^{b}32; *Z*. 1034 ^{a}5–8, 1035 ^{b}27–31; I. 1054 ^{a}34; *Λ*. 1074 ^{a}31–34; *De Caelo*, 278 ^{a}6–^{b}3.

species ? Neither by form nor by matter ; yet how otherwise can it be ?

(2) Apart from this difficulty, there is something unsatisfactory in making the principle of individuality of concrete substances to lie in their matter, in that which is 'in itself unknowable.'[1] This leads to the paradoxical conclusion that the most real things in the world (apart from the pure forms) are not fully knowable.

These difficulties must be considered further. (1) Aristotle's tendency to find the principle of individuality in matter is due to the dominance in his mind of the idea of the *infima species*, the notion that there are fixed combinations of characteristics which form the core of the nature of all the individuals in which they are present, and that these alone are what nature seeks to secure and to perpetuate. All differences of less importance and permanence than these are deemed unworthy of the name of form, and treated as the result of the union of identical form with different matter. But the source of the plurality of members of one species is not bare matter but qualified matter—is the fact that there is more of the requisite kind of matter than is needed for a single realisation of the specific form.[2] It is with a certain kind of flesh and bone that the form of man unites. But, further, if two portions of flesh and bone with which the form unites are qualitatively identical, they are no more capable of producing two distinguishable men than if they had been portions of prime matter. They must differ in character, i.e. in form. Socrates and Callias, while agreeing in their specific form, must differ in the form of their matter. By following this line of thought we should arrive at the notion of an essence of the individual, which includes besides the specific form such further permanent characteristics as spring from differences in the matter of which different individuals are made. And, taking account of the correlation of form and end in Aristotle's system, we should hold that the end of each individual is not only to reach the perfection typical of the species, but to realise it in the particular way for which its individual form fits it. There is, however, little evidence that Aristotle thought of the problem so.[3]

(2) In various passages Aristotle hints at a solution of the

[1] *Z.* 1036 ^{a}8. [2] *De Caelo*, loc. cit.

[3] The main passage is *Λ.* 1071 ^{a}27–9, 'the causes and elements of different individuals are different, your matter *and form* and moving cause and mine.' Cf. *Z.* 1038 ^{b}14 ; *De An.* 412 ^{a}6–9.

question how individuals can be known. (*a*) Individuals, though not definable, are said to be known by the aid of intuitive thought or of perception—intelligible individuals like 'this circle' by the former, sensible individuals by the latter.[1] Apart from the abstractive and discursive procedure of science there are more concrete and direct modes of apprehension by which the whole nature of the individual is grasped in a single act. Aristotle is pointing here to an important fact, the fact that our knowledge of individuals, e.g. of persons, is not held in the form of a set of universal propositions, and could not be completely stated in such a form. But he nowhere works out a theory of intuitive thought in which this function is correlated with the other functions he assigns to it—the knowledge of the first principles of science, and the knowledge of essences and of incomposite substances.[2]

(*b*) Elsewhere[3] he has a different solution. It is only knowledge as existing potentially, i.e. as it is in the mind of a man of science when he is not thinking of the object of his science, that is of the universal; actual knowledge is of the individual. Or, again, just as sight is directly 'of this colour,' and only incidentally of colour in general because this colour is a colour, so grammatical knowledge is directly 'of this instance of alpha,' and only incidentally 'of alpha.' This contention also has some truth. To take Aristotle's own instance, the actuality of grammatical knowledge cannot be confined to the grasping of a set of universal laws. The scholar who is interpreting a particular passage is in the fullest sense thinking grammatically. And what is true of this science is true of all. One might go further and say that actual scientific thought is never concerned with universals cut off from their particulars, but with universals as the universals of their particulars. There is no insight into a general law which is not accompanied by some awareness, perceptual or imaginative, of particulars that fall under it. When the particulars have been completely lost sight of, the law is no longer an object of genuine knowledge, but a convenient *memoria technica* which can be revitalised or, as Aristotle says, actualised only by a fresh contact with particulars.

But this does not meet the whole difficulty. For though scientific work is thus concerned with particulars, it is not concerned with them in their full particularity. The man of

[1] *Z.* 1036 a2–8. [2] *Θ.* 10.
[3] *M.* 1087 a10–25; cf. *De An.* 417 a21–29.

science treats them as instances of a universal, and is only vaguely aware of their differing individual natures. For adequate knowledge of them perception or intuitive thought seems necessary as well as science.

The long debate of Book *Z* on the question, what is the substantial element in things, closes[1] with the declaration that it is form or essence. The mode of approach is as follows. It is agreed that substance is an originative source and cause, that it is what makes things what they are. It is the answer to the question 'why ?', e.g. 'why does it thunder ?' or 'why do these bricks and stones make a house ?' In all such cases we are looking for a cause which is—to speak abstractly— the essence, but is in some cases, as in that of a house (or generally of *artefacta*), the end to be subserved, and in some (as in that of thunder) the moving cause. Our question always is, What makes the matter into a particular thing ? The answer is, The presence of the essence of the particular thing, which is not another element in the thing alongside of its material elements, nor anything compounded out of elements. This it is that makes certain elements into flesh and certain others into a syllable.

The point that Aristotle chiefly stresses here is that the essence is not to be thought of either as a component existing alongside of the material components, or as itself consisting of material components. If we view it in the former way we shall need a further principle of structure to explain how it is united with the material components ; if in the latter way, we shall want to know how these components are united to form the essence, i.e. we shall have to ask about the essence what we originally asked about the concrete thing—what makes it what it is. We must pass clean away from any materialistic understanding of the essence and treat it as the principle of structure of the concrete thing. It might be thought that Plato had in the doctrine of Forms sufficiently emphasised this point against the materialistic views of the pre-Socratics. But it is right that Aristotle, in rejecting the Platonic doctrine of transcendent form, should lay stress on the equally immaterial nature of the immanent form in which he himself believes.

It is noteworthy that even in naming essence as the answer to the question 'What is the cause of a thing's being, and therefore its substance ?', Aristotle indicates that this answer is but an abstract one. If we ask what makes this flesh and these

[1] *Z.* 17.

bones into a man, these bricks and stones into a house, these clouds into thundering clouds, it is no doubt true to say 'the presence of the essence of a man, of a house, or of thunder.' But the answer takes us no further. Aristotle points the way to a more real explanation by saying that what we describe abstractly as the essence is, viewed concretely, sometimes a final, sometimes an efficient cause. Normally it is a final cause. The reason why this flesh and these bones make a man is that they are informed by the form of man, the human soul; but an answer that goes deeper is the answer 'because they are organised in such a way as to subserve the ends for which man exists, intellectual and moral activity.' In his biology, Aristotle steadily aims at explaining structure by function. And similarly with *artefacta*. What makes these bricks and stones into a house? The fact that they are so arranged as to serve as a shelter for living things and goods.[1] Normally, then, the formal cause is also a final cause.[2] But in the production of natural substances and of *artefacta* certain by-products emerge for which no final cause is to be posited,[3] and which are to be explained mechanically, by reference to a moving cause. Thunder may no doubt be, as the Pythagoreans said, designed to terrorise the inhabitants of Tartarus, but it is safer to explain it as due to the quenching of fire in clouds, or by some other mechanical explanation.[4] And even that which is due to a final cause is also due to a mechanical cause. The light's streaming through the lantern serves to prevent us from stumbling, but is due to the fact that that which has smaller pores must pass through that which has larger pores, or to some other physical reason.[5] And this double action, of final cause and necessity, is normally at work in natural substances as well as in *artefacta*.[6] Thus Book *Z*, while identifying substance, what makes a thing what it is, with essence, points to a less abstract and a more satisfying explanation by final or by mechanical causes or by both together.

The Analysis of Becoming

It is natural to turn next to Aristotle's analysis of becoming.[7] His main object is to show that in each of the three modes of production—natural, artistic, and spontaneous—similar condi-

[1] *H.* 1043 ^{a}16, 33.
[2] 1044 ^{b}1.
[3] *Ib.* 12.
[4] *An. Post.* 94 ^{b}33.
[5] *Ib.* 27–31.
[6] *Ib.* 34–37.
[7] *Z.* 7–9.

tions are involved. (1) By nature in this connexion Aristotle means the power, inherent in all living things, of initiating change, and, in particular, of reproducing their kind. In natural as in all other generation 'all things that come to be come to be by some agency and from something, and come to be something.'[1] I.e. what is involved in natural generation is: (*a*) an individual which already has the specific form which the offspring is to have, i.e. the male parent;[2] (*b*) a matter capable of being the vehicle of the specific form, i.e. the matter contributed by the female parent;[3] (*c*) a new individual with the same specific form. (2) In artistic production the pre-existence of the form is less obvious. The making of a house does not pre-suppose the existence of an actual house as generation presupposes an actual father. Nevertheless in a sense there is a pre-existing house, viz. the form of house as conceived by the builder.[4] (3) Spontaneous production is of two kinds—one which imitates nature and one which imitates art. An unskilled person may originate by accident the same treatment which a doctor would have prescribed on scientific grounds;[5] and reproduction, which in the higher kinds of living thing requires sexual union, takes place in the lower (so Aristotle believes) spontaneously.[6] And in both these cases he labours to show that, as in natural and artistic production, a part of the product must exist beforehand.[7]

In generation form is not generated any more than matter. If form were itself being produced, it would be being produced out of something else, i.e. by the imposition of other form on other matter, and if *that* form were being produced, it would be by the imposition of yet other form on other matter, and so *ad infinitum*.[8] The most obvious interpretation of this passage would be that it teaches the eternity of form. Yet sometimes Aristotle speaks of form as coming into being and passing out of being instantaneously.[9] We must distinguish, it would appear, between generation proper, the origination of a new substance, and the minor forms of change, change of quality or of size, which will include all production of *artefacta*. In the former case the form must pre-exist actually, in the male parent; in the latter it need only pre-exist potentially.[10] In

[1] 1032 a13. [2] 1034 a21–b1, 1032 a25. [3] *H.* 1044 a35.
[4] *Z.* 1032 b1. [5] 1034 a20.
[6] 1032 a30, 1034 b4–6. [7] 1034 a24–30.
[8] 1033 a24–b19.
[9] 1039 b26; *H.* 1044 b21, 1043 b15. [10] *Z.* 1034 b18.

this case it is not eternal; but it is not brought into being by a process. It supervenes instantaneously on a process. At one moment it is not and at another it is, but it is never coming into being. A white thing may become black, but white does not become black. The white thing becomes black bit by bit, but in each part black supervenes instantaneously on white.[1] Contacts, like forms, 'are and are not, without becoming or perishing';[2] and the form of the individual house comes into being instantaneously with the last instantaneous contact of tile with tile, the form of the individual bronze vessel with the last contact of the hammer with the bronze. Similarly, the *individual* form of the individual animal comes into being instantaneously at the last moment of the vitalising transformation of the female element by the male. That which becomes becomes bit by bit, but the form has no parts; it is the structure of the whole.[3]

Even where the *specific* form pre-exists actually (i.e. in natural generation), it does not exist apart from individual instances. Form is eternal only by virtue of the never-failing succession of its embodiments. Form indicates a 'such,' never a 'this'; a characteristic, never the concrete thing that bears it. And this is why the Platonic Forms are useless for explaining the facts of generation.[4]

To this account of becoming must be added that of Book *Λ*.[5] Besides the three internal causes—form, matter, privation[6]—*Λ* draws attention to three external causes, viz. (1) the proximate moving cause, i.e. in artistic production the art involved, and in natural generation the male parent;[7] (2) in the case of natural generation, the remote and common moving cause, viz. the sun as it moves along the ecliptic and produces the sequence of the seasons;[8] (3) the ultimate or first moving cause which moves not by mechanical agency, but by being desired and loved.[9] *Λ* thus takes a wider sweep than *Z*. The interest of *Z* in becoming lies in the light it throws on the relation of form to matter; the interest of *Λ* is in the question how far all things may be said to have the same causes.[10] Aristotle points out that, except as regards the first cause, things in different genera have only analogically the same causes; and he recognises more

[1] *H.* 1044 ^{b}21–26; *Phys.* VI. 4. [2] *De Caelo* 280 ^{b}27.
[3] Alex. *in Met.* 486, 13–33. Cf. *Λ.* 1070 ^{a}21–24.
[4] *Z.* 1033 ^{b}19–29. [5] *Λ.* 4, 5.
[6] 1069 ^{b}32–34, 1070 ^{b}18, 22. [7] 1071 ^{a}14, 28.
[8] *Ib.* 15. [9] *Ib.* 36. [10] 1070 ^{a}31.

clearly than elsewhere the existence of individual as distinct from specific form, when he says 'your matter and form and moving cause are different from mine, though they are the same in their general description.'[1] And in the same spirit he insists that 'universal causes do not exist; the individual is the cause of individuals; man is the cause of man universally, but there is no universal man; Peleus is the cause of Achilles, and your father of you.'[2] So, too, the prime cause is not a general principle, but an individual spirit.[3]

Potentiality and Actuality

The distinction of form and matter is in Book *Z* treated for the most part as one which exists within an individual thing at any moment of its history, as the distinction between the essence of a thing as it is stated in definition, and the unknowable substratum without which the essence cannot exist. But as the discussion proceeds Aristotle comes to pay more attention to the advance of things from a relatively unformed to a relatively formed condition, and the expressions 'potentiality' and 'actuality' begin to be used; and in Book *Θ* he turns to the discussion of this distinction. He distinguishes two senses of δύναμις.[4] One is that which the word in ordinary Greek connotes, viz. power, the power in one thing to produce change of some sort in another. The other, in which he is mainly interested, is the potentiality in a single thing of passing from one state into another. He sees clearly that the notion of potentiality is indefinable; he can only indicate its nature by pointing to particular instances. As a man who is building is to one who knows how to build, as the waking is to the sleeping, that which sees to that which has sight but has its eyes shut, that which is shaped out of matter to its matter, the finished product to the raw material, so in general is actuality to potentiality.

The Megaric school had denied the existence of potentiality. A thing, they said, either is or is not in a certain state, and that is all that there is to be said about it. What Aristotle does is to insist that that is *not* all that there is to be said about it. It may seem a mere truism to say that before *A* actually was in the state *B* it must have potentially been so; and no doubt

[1] 1071 ᵃ27. [2] *Ib.* 19–23. [3] 1075 ᵃ11–15.
[4] 1045 ᵇ35–1046 ᵃ11, 1048 ᵃ25–ᵇ4.

if we answer the question 'why did A become B actually' by saying 'because it already was B potentially,' we are giving an answer which is no answer. The conception of potentiality has often been used to cover mere barrenness of thought. Yet there is a real point in Aristotle's insistence on the conception. The point is that change is not catastrophic. It is not the case that A which is sheerly not-B suddenly becomes B. Consider A more carefully and you will find some of the conditions of B-ness already present; if it were not so, A would never become B. A man who has learnt the building art can, when he pleases and when he has the materials, begin to build; a man who has not, cannot do so. We must therefore recognise in the one a capacity of building which is absent in the other. Or again, there are two men neither of whom is hearing anything. But let a bell be sounded near them; one hears and the other does not. Plain facts drive us to recognise a difference between their previous conditions, the difference which we express by saying that the one can hear and the other cannot. We cannot explain change without potentiality.[1]

But neither can we explain it by potentiality alone. Nothing is promoted from potentiality to actuality without the agency of something actual. And actuality is prior to potentiality. It is logically prior, since 'being capable of being B' is a more complex notion than 'being B.' But it is also prior in another sense. A is not potentially B unless it can come to be actually B, and since it cannot do so except by the agency of something already actual, its very potentiality of being B presupposes an actuality. Potentiality indeed everywhere presupposes and is rooted in actuality. E.g., I am capable of knowing what I do not now know, just because there is something that I know already; all knowledge comes from pre-existing knowledge. And further, the ultimate explanation of things, for Aristotle, lies in the end which they subserve. Now actuality is the end to which potentiality points, and not *vice versa*. Animals do not see in order that they may have the faculty of sight, but have this in order that they may see.[2]

But the main proof of the priority of actuality is the following:[3]—What is eternal is prior in nature to what is perishable; and nothing is eternal by virtue of potentiality. For that which has the potentiality of being has also the potentiality of not-

[1] Θ. 3. [2] 1049 b4–1050 b2.
[3] 1050 b6–1051 a2.

being, while the eternal is that which from its very nature cannot fail to be. In a sense, therefore, all the primordial entities in the universe are free from potentiality. God is in the fullest sense actual, since He is always what He is at any time, and has no element of unrealised potentiality. Form too is perfectly actual. No specific form ever begins or ceases to be; it only comes to be actualised in fresh individuals. Even matter, though from one point of view it is sheer potentiality, is free from the type of potentiality which cuts deepest, the potentiality of not-being; it is eternal. And, as we have seen, all individual things in the world may be graded according to the extent to which they are infected with potentiality. The heavenly bodies are (apart from God and the intelligences) the least infected by it; they have no potentiality of coming into being or of passing away, of changing in size or in quality, but only that which is concerned with local movement. And even that is not a potentiality of moving or not-moving. By their nature they are necessarily ever in movement, and the only potentiality involved is that their movement may be from A to B or from B to C or from C to A. All sublunary things are subject to all four kinds of potentiality, but even there there is something that is purely actual, viz. the *infimae species* which are eternal by reason of the never-failing succession of the generations.

Finally, Aristotle's doctrine of the priority of actuality leads him to deny the existence of any evil principle in the world.[1] That which is potential is as much superior to bad actuality as it is inferior to good. If that which is eternal can have no element of potentiality, *a fortiori* it can have no element of evil. 'There is no evil apart from particular things.' Evil in other words is not a necessary feature of the universe but a by-product of the world-process, something that casually emerges in the course of the endeavour of individual things to reach such perfection as is open to them, and thus to approximate as nearly as they can to the divine life, 'to become immortal as far as they can.'[2] That they to a large extent fail is due to matter or necessity, but this is not an evil principle but a principle indifferent to good and evil. And for Aristotle the world-process is so much a striving after form or good that matter itself is sometimes described as so striving.[3]

[1] 1051 ^{a}4–21. [2] *E.N.* 1177 ^{b}33.
[3] *Phys.* 192 ^{a}16–23.

Aristotle's Theology

Book *Λ* is rightly regarded as the coping-stone of the *Metaphysics*. Aristotle has given the name of 'theology' to the highest of the sciences, the science of that kind of being which combines substantial, self-dependent existence with freedom from all change;[1] and it is in this book that we find his only systematic essay in theology. There are passages in his other works which throw valuable light on his theological views;[2] and others in which he is clearly accommodating himself to the views of his age.[3] He seems to have put forward in his earlier writings 'proofs of the existence of God' quite different from that which is found in *Λ*. In the dialogue *On Philosophy* he is said to have given what may be called an anticipation of the ontological argument; 'where there is a better,' he argued, 'there is a best; now among existing things one is better than another; therefore there is a best, which must be the divine.'[4] Nor did he fail to use the teleological argument. In the same dialogue he pictured a race of men beholding for the first time the beauty of earth and sea, the majesty of the starry heavens, and drawing the conclusion that these mighty works proceed from gods.[5] Dreams, premonitions,[6] and animal instinct[7] were further used by him as evidence for the existence of divine beings. But in his extant works, which express his maturer views, adaptation is usually ascribed to the unconscious teleology of nature rather than to the working out of a divine plan.

In *Λ*,[8] however, we find him arguing for the existence of a God so remote from popular religious ideas that no element of accommodation to the intelligence or the prejudices of his audience is to be suspected; and arguing from principles that are deep-seated in his metaphysics. The argument, which is a form of the cosmological argument, may be set out as follows. Substances are the first of existing things.[9] Therefore if all substances are perishable, all things are perishable. But there

[1] *E.* 1026 ᵃ10–19; *K.* 1064 ᵃ33–ᵇ3.

[2] On the question whether the 'active reason' of the *De Anima* is to be identified with God, cf. pp. 148–153.

[3] These can often be recognized by a reference to "gods" in the plural. Cf. *E.N.* 1099 ᵇ11, 1162 ᵃ5, 1179 ᵃ25.

[4] Fr. 1476 ᵇ22–24.

[5] *Ib.* ᵃ34–ᵇ11. Cf. ᵃ11–32.

[6] Fr. 1475 ᵇ36–1476 ᵃ9.

[7] Cic. *de N. D.* ii. 49, 125.

[8] capp. 6, 7.

[9] 1069 ᵃ19–26, cf. *Z.* 1.

are two things that are imperishable, change and time. Time cannot have come into being and cannot cease to be, since that would mean that there was a time before time was, or that there will be a time after time has ceased. And change must be equally continuous with time, since time is, if not identical with change, a concomitant of it.[1] Now the only continuous change is change of place,[2] and the only continuous change of place is circular motion.[3] There must therefore be an eternal circular motion.[4]

To produce eternal motion there must be (1) eternal substance. So far the Platonic Forms would suffice. But (2) this eternal substance must be capable of causing motion, which Forms are not.[5] (3) It must not only have this power but exercise it. (4) Its essence must be not power but activity, for otherwise it would be possible for it not to exercise this power, and change would not be eternal, i.e. *necessarily* everlasting. (5) Such substance must be immaterial, since it must be eternal.[6]

This result is confirmed by experience,[7] which shows that there is something that moves with an unceasing circular motion, viz. the starry heavens. There must be something that moves it. Now that which moves and is moved is an intermediate with which we cannot rest content; there must be something that moves without being moved.[8] And the unmoved mover to which experience points must be the eternal, substantial, purely actual being whose existence has already been proved.

Now, how can anything cause motion without being moved? The physical causation of movement implies the mutual contact of mover and moved, and therefore a reaction of the moved on the mover.[9] The unmoved mover must therefore cause motion in a non-physical way, by being an object of desire. In one passage the causation of movement by the first mover is thought of as having a quasi-physical character; the first mover is said not merely to operate directly on the outer sphere of the universe, and only indirectly on the inner spheres, but actually to be at the outside of the universe;[10] this, however, is an incautious expression which should not be pressed.

[1] Viz. 'the number of change,' *Phys.* 219 ^{b}1, etc.
[2] *Phys.* 261 ^{a}31–^{b}26.
[3] 261 ^{b}27–263 ^{a}3, 264 ^{a}7–265 ^{a}12.
[4] *Λ.* 1071 ^{b}4–11.
[5] Cf. *Α.* 991 ^{a}8–11, ^{b}3–9, 992 ^{a}29–32; *Z.* 1033 ^{b}26–1034 ^{a}5.
[6] *Λ.* 1071 ^{b}12–22.
[7] 1072 ^{a}22.
[8] Cf. *Phys.* 257 ^{a}31–^{b}13.
[9] *Ib.* 202 ^{a}3–7.
[10] *Ib.* 267 ^{b}6–9.

Aristotle's genuine view is that the prime mover is not in space.[1]

There has been much controversy over the question whether God is for Aristotle only the final cause, or the efficient cause as well, of change. The answer is that God is the efficient cause by being the final cause, but in no other way. Yet He is the final cause not in the sense of being something that never is but always is to be. He is an ever-living being whose influence radiates through the universe in such wise that everything that happens—at any rate if we leave out of account the obscure realms of chance and free-will—depends on Him. He moves directly the 'first heaven'; i.e. He causes the daily rotation of the stars round the earth. Since He moves by inspiring love and desire, it seems to be implied that the 'first heaven' has soul. And this is confirmed by statements elsewhere that the heavenly bodies are living beings.[2] The motions of the sun, moon, and planets are explained by the hypothesis of a 'nest' of concentric spheres each with its poles fixed in the shell of the sphere next outside it. Thus each sphere imparts its own motion to the sphere next inside it, and the prime mover, by moving the outermost sphere, moves all the others. It causes the sun to move round the earth once in twenty-four hours, and thus produces the rhythm of day and night, and everything in terrestrial life for which that is responsible. But the rhythm of the seasons, with its consequences of seed-time and harvest and of the breeding-times of animals, is more important in the terrestrial economy, and this is due to the sun's *yearly* movement in the ecliptic; generation at any particular place tends to occur when the sun is approaching that part of the earth, and destruction when it is going away.[3] And this movement, like the other *special* movements of sun, moon, and planets, is due to the 'intelligences.' These too move 'as ends';[4] i.e. they move by being desired and loved. Their relation to the first mover is not specified, but since the first mover is the single ruler of the universe,[5] that on which 'the heaven and the whole of nature depend,'[6] we must suppose that it moves the intelligences as the object of their desire and love. The detail of the system is left somewhat obscure, but we must probably think of each heavenly sphere as a unity of soul and body desiring and loving its corresponding 'intelligence.'

How does love or desire produce the physical movements

[1] *De Caelo* 279 ᵃ18.
[2] *Ib.* 285 ᵃ29, 292 ᵃ20, ᵇ1.
[3] *De Gen. et Corr.* 336 ᵃ32, ᵇ6.
[4] *Λ.* 1074 ᵃ23.
[5] 1076 ᵃ4.
[6] 1072 ᵇ13.

that have to be explained? The theory is that each of these spheres desires a life as like as possible to that of its moving principle. The life of its moving principle is a continuous unchanging spiritual life. The spheres cannot reproduce this, but they do the next best by performing the only perfectly continuous physical movement, viz. movement in a circle.[1] Rectilinear movement was ruled out for Aristotle by the fact that if it is to be continuous it requires infinite space, in which he disbelieved.[2]

We may now turn to Aristotle's account of the prime mover itself. Physical activity being excluded by its immaterial nature, he ascribes to it only mental activity, and only that kind of mental activity which owes nothing to the body, viz. knowledge; and only that kind of knowledge which involves no process, no transition from premises to conclusion, but is direct and intuitive. The prime mover is not only form and actuality, but life and mind, and the term God, which has not so far appeared, begins to be applied to it.[3]

Now knowledge, when not dependent, as in man, on sense and imagination, must be of that which is best; and that which is best is God. The object of his knowledge is therefore Himself. 'Now mind knows itself by participation in the known; it becomes known by touching and knowing, so that the same thing is mind and object of mind.'[4] I.e. in intuition mind is as it were in direct contact with its object; it is not then knowing one thing by means of another as middle term. Just as in sensation the sensible form is carried over into the mind, leaving the matter behind,[5] so in knowledge the intelligible form is carried over. And the character of mind is to have no character of its own but to be characterised entirely by what at the moment it knows; if it had a character of its own, that would interfere with the perfect reproduction of the object in the knowing mind, as a mirror with a colour of its own reproduces less perfectly the colour of the mirrored object.[6] Thus in knowledge mind and its object have an identical character, and to know an object is to know one's mind as it is in knowing the object.

This explanation of self-consciousness is intended primarily to explain the self-consciousness which accompanies knowledge of an object. It is in and by knowing something else that mind becomes object of mind. We must not suppose that what it

[1] *Phys.* 265 ᵇ1. [2] 265 ᵃ17. [3] *Λ.* 1072 ᵇ25.
[4] *Ib.* 20. [5] *De An.* 424 ᵃ18. [6] *Ib.* 429 ᵃ13–22.

knows primarily is itself, or what is offered as an explanation of its becoming its own object turns into a *petitio principii.* But what Aristotle ascribes to God is knowledge which has *only* itself for its object. An attempt has been made to render Aristotle's conception of the divine knowledge more tolerable by exhibiting it as being, conversely to ordinary knowledge, knowledge of itself directly and of the world indirectly. *Nec tamen sequitur,* says St. Thomas, *quod omnia alia a se ei sunt ignota ; nam intelligendo se intelligit omnia alia.*[1] Many others of the schoolmen express the same view, and Brentano supports it by reference to a passage[2] in which Aristotle says that the knowledge of correlatives is the same. All things other than God owe their being entirely to God, so that God's self-knowledge must be at the same time a knowledge of all other things. This is a possible and a fruitful line of thought, but it is not that which Aristotle adopts. For him, that God should know Himself, and that He should know other things, are alternatives,[3] and in affirming the first alternative he implicitly denies the second. Indeed he denies explicitly much that the second would involve ; he denies to God all knowledge of evil, and all transition from one object of thought to another.[4] The result of the wish to exclude from the divine life any relation to evil and any ' shadow of turning ' is the impossible and barren ideal of a knowledge with no object but itself.

The conception of God presented in *Λ* is certainly an unsatisfactory one. God, as conceived by Aristotle, has a knowledge which is not knowledge of the universe, and an influence on the universe which does not flow from His knowledge ; an influence which can hardly be called an activity since it is the sort of influence that one person may unconsciously have on another, or that even a statue or a picture may have on its admirer. Little wonder that commentators have found it hard to believe that this is really Aristotle's view, and have tried to read something different into what he says. Even Alexander tried to find in his master some recognition of divine providence, and most ancient scholars agreed with him in this. Even Averroes, while denying to God any creative activity and any freedom of will, ascribed to Him—and thought he was following Aristotle in doing so—a knowledge of the general laws of the universe. St. Thomas and Duns Scotus expressed themselves cautiously, but tended to interpret Aristotle's God in a theistic sense. Our

[1] *In Met.* lib. xii. lect. xi.
[2] *Top.* 105 b31–34.
[3] *Λ.* 1074 b22.
[4] *Ib.* 25, 32, 26.

own time has witnessed a long controversy between Brentano and Zeller, the former maintaining, the latter denying, the theistic interpretation. Brentano's attempt must be pronounced a failure;[1] Aristotle has no theory either of divine creation or of divine providence. But there are traces in him of a way of thinking less arid than that which we have seen to be his deliberate theory.

That God's activity is one of knowledge, and of knowledge alone, is not merely the theory of *Λ*; it appears to be part of Aristotle's permanent thought, and is expressed with equal clearness elsewhere.[2] On the other hand, in criticising Empedocles for excluding part of reality from God's knowledge, he, in effect, criticises his own limitation of God's knowledge to self-knowledge.[3] While Aristotle, when he considers the nature of God, feels that the ascription to Him of any practical interest in the world would detract from His perfection, when he considers the world he tends to think of God in a way which brings God into closer relation with the world.

If the question be asked, whether Aristotle thinks of God as creator of the world, the answer must certainly be that he does not. For him matter is ungenerated, eternal; he expressly argues against a creation of the world.[4] This would not necessarily exclude the view that matter is throughout eternity maintained in existence by God, but there is no trace of such a doctrine in Aristotle. Further, the intelligences appear to be independently existing, uncreated beings. And Brentano's attempt to show that the reason of each individual human being is created by God at the birth of the individual breaks down over passages in which the eternal pre-existence of reason is clearly maintained.[5]

There is one passage of *Λ* in which Aristotle at first sight seems to suggest that God exists immanently in the world as well as transcendently. 'We should consider in which of two ways the nature of the whole possesses the good and the best—whether as something existing separately and by itself, or as the

[1] It is examined in detail by K. Elser in *Die Lehre des A. über das Wirken Gottes*, Münster, 1893. I have reviewed the main points of Brentano's argument in *Mind* xxiii. 289–291.

[2] *De Caelo* 292 ^{a}22, ^{b}4; *E.N.* 1158 ^{b}35, 1159 ^{a}4, 1178 ^{b}10; *Pol.* 1325 ^{b}28. *πρᾶξις* is ascribed to God in *E.N.* 1154 ^{b}25, *Pol.* 1325 ^{b}30, but in a wider sense in which *θεωρία* is a kind of *πρᾶξις* (1325 ^{b}20).

[3] *Met.* B. 1000 ^{b}3; *De An.* 410 ^{b}4.

[4] *De Caelo* 301 ^{b}31, 279 ^{b}12 ff.

[5] Notably *De An.* 430 ^{a}23.

order of the whole. Perhaps we should say that it possesses the good in both ways, as an army does. For it is true both that its good is in its order, and that its leader is its good, and the latter in a higher degree ; for he does not exist by reason of the order, but the order by reason of him.'[1] But, though Aristotle says that the good exists both as a transcendent spirit, and as an immanent order, he does not say that *God* exists in both these ways. God is essentially for him, in *Λ*, the first cause ; and in view of his often-repeated doctrine of the priority of substance, the cause must for him be a substance and not an abstraction such as order is. Yet he speaks of the order as due to God, so that his God may truly be said to be at work in the world, and in *this* sense immanent.

One of the most conspicuous features of Aristotle's view of the universe is his thorough-going teleology. Apart from occasional sports and coincidences all that exists or happens exists or happens for an end. But it is not so clear what interpretation is to be put on this view. Does he mean (1) that the structure and history of the universe is the fulfilment of a divine plan ? Or (2) that it is due to the conscious working towards ends of individual beings ? Or (3) that there is in nature an unconscious striving towards ends ? (1) The first alternative is out of keeping with the theory of *Λ*, according to which the sole activity of God is self-knowledge. But there are traces even in *Λ* of a different way of thought. When God is compared to the captain of an army, to whom the order in the army is due, or to the ruler of a people, or when the universe is compared to a household in which functions more or less definite are assigned to all the members from the highest to the lowest,[2] it is difficult not to suppose that Aristotle is thinking of God as controlling by His will the main lines of development of the world's history. And similar language is not lacking elsewhere. Alexander ascribed to Aristotle a belief in providential activity, so far as the maintenance of species is concerned. This interpretation is based on a passage[3] in which Aristotle says that for those beings which, by reason of their distance from the first principle, are incapable of permanent existence (i.e. for men, animals, and plants, in contrast with the stars) God has provided what is next best by arranging for the continuance of generation. Similarly, the praise of Anaxagoras[4] for introducing reason as the cause of order in the world implies

[1] 1075 ^{a}11–15.
[2] 1075 ^{a}15, 1076 ^{a}4, 1075 ^{a}19.
[3] *De Gen. et Corr.* 336 ^{b}31.
[4] *A.* 984 ^{b}15.

the ascription to God of a general ordering of the universe, as also do such phrases as 'God and nature do nothing in vain.'[1] But it is remarkable how little trace there is of this way of thinking, if we discount passages where Aristotle is probably accommodating himself to common opinions; he never uses the word 'providence' of God, as Socrates and Plato had done[2]; he has no serious belief in divine rewards and punishments; he has no interest as Plato has in justifying the ways of God to man.[3]

(2) The second alternative appears to be ruled out by the fact that the teleology in nature is definitely opposed to the working of thought.[4] On the whole, it would seem that view (3) is that which prevails in Aristotle's mind. For the one passage in which he says that God and nature do nothing in vain, there are many in which he says simply that nature does nothing in vain. The notion of unconscious teleology is, it is true, unsatisfactory. If we are to view action not merely as producing a result but as being aimed at producing it, we must view the agent either as imagining the result and aiming at reaching it, or as the tool of some other intelligence which through it is realising its conscious purposes. Unconscious teleology implies a purpose which is not the purpose of any mind, and hence not a purpose at all. But Aristotle's language suggests that he (like many modern thinkers) did not feel this difficulty, and that, for the most part, he was content to work with the notion of an unconscious purpose in nature itself.

[1] *De Caelo* 271 ᵃ33.
[2] Xen. *Mem.* i. 4, 6, etc.; Pl. *Tim.* 30 c, 44 c.
[3] His solution of the problem of evil lies in a reference to τὸ κακοποιόν inherent in matter (*Phys.* 192 ᵃ15). Not that matter has any predisposition towards evil; but, being a potentiality of opposites, it is a potentiality of evil as well as of good.
[4] *Phys.* 199 ᵇ26.

CHAPTER VII

ETHICS

KNOWLEDGE, according to Aristotle, is of three main kinds—theoretical, practical, or productive, according as it is pursued for its own sake, as a means to conduct, or as a means to making something that is useful or beautiful. The supreme practical science—that to which all others are subordinate and ministerial—is politics, or, as we, with our fuller consciousness of man's membership of communities other than the state, might be more inclined to call it, social science. Of this science ethics is but a part, and accordingly Aristotle never speaks of 'ethics' as a separate science, but only of 'the study of character' or 'our discussions of character.'[1]

The complete science of 'politics' falls into two parts which may for convenience be called ethics and politics. Aristotle's ethics, no doubt, are social, and his politics are ethical; he does not forget in the *Ethics* that the individual man is essentially a member of society, nor in the *Politics* that the good life of the state exists only in the good lives of its citizens. Still, he has no doubt that there is a difference between the two enquiries. About the nature of the relation between them he is not so clear. At the outset of the *Ethics* he describes the good of the state as 'greater and more perfect' than that of the individual, and the latter as merely something with which we may have to put up if we cannot attain the former.[2] But his sense of the value of the individual life appears to grow as he discusses it, and at the end of the work he speaks as if the state were merely ancillary to the moral life of the individual, supplying the element of compulsion which is needed if man's desires are to be made subservient to his reason.[3]

The keynote of the *Ethics* is struck in the first sentence: 'Every art and every enquiry, every action and choice, seems

[1] *An. Post.* 89 ᵇ9; *Pol.* 1261 ᵃ31, etc.
[2] *E.N.* 1094 ᵇ7–10. [3] 1179 ᵃ33 ff.

to aim at some good; whence the good has rightly been defined as that at which all things aim.' All action aims at something beyond itself, and from its tendency to produce this it derives its value. Aristotle's ethics is definitely teleological; morality for him consists in doing certain actions not because we see them to be right in themselves but because we see them to be such as will bring us nearer to the 'good for man.' This view, however, cannot really be reconciled with the distinction he draws between action or conduct, which is valuable in itself, and production, which derives its value from the 'work'—the bridle, the statue, or whatever it may be that it produces. If he had held fast to that distinction he would have reached a more Kantian type of theory. The distinction is not without influence on his ethics, but in the main the category of means and end is that by which he interprets human action.

The end at which a particular action aims may be but a means to a further end, but there must be a term to this series; each action must have an ultimate end which is valuable in itself, and, Aristotle seems unwarrantably to infer, the ultimate end of all actions must be the same. Two questions thus arise—What is this end? and What science investigates it? The second question is easily answered. Political science ordains what sciences shall be studied and by whom; to political science the most highly esteemed capacities, such as strategy, are subordinate; political science tells us what we must do and what we must not do; it is political science, then, that studies the good for man.[1] The other question is harder and demands for its full solution the whole remainder of the *Ethics*. We must be content to answer it with the accuracy of which the subject-matter permits. Ethics is concerned with 'things which are for the most part so,' 'things which are capable of being otherwise,' and we must not expect in it the perfect demonstrations that are possible for a science which, like mathematics, deals with 'things that are of necessity.'[2] Aristotle frequently distinguishes between the necessary and the contingent element in the universe. It is not always clear whether he means that there are events which are objectively undetermined, or is distinguishing between necessity which we can trace and that which eludes us; but apparently he believes that in human action, at all events, there is an actual contingency. Even if we grant, however, (1) that the physical consequences of our acts cannot be accurately foreseen, and

[1] 1094 ^{a}1–^{b}11. [2] ^{b}11–27.

(2) that future actions are actually indeterminate, Aristotle seems to be wrong in supposing that these facts diminish the accuracy possible to moral philosophy. They make it impossible to say with precision which actions will produce the best results ; but the science that is affected by this is applied ethics or casuistry, the attempt to say what we ought to do in given circumstances, not abstract ethics, which enquires what 'ought' means, and why we ought to do what we ought to do.

The difference between ethics and the exact sciences is better expressed elsewhere. Ethics reasons not from but to first principles ; it starts not with what is intelligible in itself but with what is familiar to us, i.e. with the bare facts, and works back from them to the underlying reasons ; and to give the necessary knowledge of the facts a good upbringing is necessary. Mathematics deals with a subject-matter the first principles of which are acquired by an easy abstraction from sense-data ; the substance of mathematics is the deduction of conclusions from these first principles. The first principles of ethics are too deeply immersed in the detail of conduct to be thus easily picked out, and the substance of ethics consists in picking them out. For this two conditions are needed. Firstly, the student must be so brought up that he accepts the general opinions on moral questions which represent the collective wisdom of the race. These opinions are not very clear nor very consistent, but such as they are, they are the only data we have from which to reach the first principles. The second condition is an enquiry in which these beliefs are examined, compared with one another, purged of their inaccuracies and inconsistencies, and found to yield truths 'more intelligible in themselves,' by no means obvious at first sight but self-evident when once you have reached them.[1] If ethics is not demonstrative, is it then (to use a distinction frequently drawn in Aristotle's logic) dialectical ? In a sense it is ; one of the uses of dialectic is just this, to lead us to first principles.[2] Hence Aristotle often reasons dialectically, not from the principles known to be true but from the opinions whether of 'the many' or of 'the wise,' and particularly from those of the Platonic school. But it does not follow that the *Ethics* is a prolonged *argumentum ad hominem* from opinions which he does not himself accept ; he would certainly not have thought that worth his while. For

[1] 1095 ^{a}2–11, 30–^{b}13, 1098 ^{a}33–^{b}4, 1142 ^{a}11–20, 1145 ^{b}2–7.
[2] *Top.* 101 ^{a}36–^{b}4.

the most part he accepts the opinions of the Academy as his own, and when he does not he has no hesitation in saying so.

THE END OF HUMAN LIFE

Aristotle accepts from 'the many' the view that the end is εὐδαιμονία.[1] The corresponding adjective originally meant 'watched over by a good genius,' but in ordinary Greek usage the word means simply happiness, often with special reference to external prosperity. The difficulty about translating it 'happiness' in the *Ethics* is that, whereas 'happiness' means a state of feeling, differing from 'pleasure' only by its suggestion of permanence, depth, and serenity, Aristotle insists that εὐδαιμονία is a kind of activity; that it is not any kind of pleasure, though pleasure naturally accompanies it. Some more non-committal translation is therefore wanted. If the question be asked whether Aristotle was a hedonist, it is better to go by his repeated and deliberate statement that the end of life is activity rather than by his use, for want of a better word, of one which suggests not action but feeling.

To say that the good for man is εὐδαιμονία does not, Aristotle admits, take us far. We want to know what sort of life is εὐδαιμονία. Four main kinds of life seem in fact to be chosen by men. Most men aim at *pleasure*; but this is an end for slaves or beasts. The better sort aim at *honour*; this is the object of the political life. But honour depends more on the giver than on the receiver, while the end of life must be something that is our very own. Honour seems to be aimed at as something that assures us of our own virtue, and virtue is perhaps more truly the end of the political life. But virtue is compatible with inactivity, and with misery, and on both these counts is disqualified for being the true end. Some men, again, pursue *wealth*; but this is a means, not an end. The life of *contemplation* is deferred to Book X. where Aristotle tries to show that it is the highest end.[2]

Plato has propounded something more abstruse than these obvious goods—a Form of Good which is the source of all goodness wherever it is found in the universe. Against this Aristotle argues (1) that 'good' has no meaning common to all its applications. Yet he cannot bring himself to say that its use is merely equivocal; he compromises by suggesting that

[1] 1095 a14–20.   [2] 1095 b14–1096 a10.

all goods point to, or are derived from, one single good (the good in the category of substance, the goodness of God or of reason), or that they are one by analogy—that the good in one category is to other things in that category as the good in a second category is to other things in it. He argues (2), as he might have argued about *any* Platonic Form, that there is no Form of good separate from its particular manifestations; and (3) that if there were it would be useless for practical purposes; the good *for man* is the widest good the contemplation of which will aid us in our daily life.[1]

There are two marks which the good for man must possess. It must be final, something that is chosen always for its own sake, never as a means to anything else. And it must be self-sufficient, something which by itself makes life worthy of being chosen. Both these marks belong to happiness. But we have still to ask what happiness is. To enable him to answer this question, Aristotle introduces the Platonic notion of work or function. He is at bottom asking what kind of life will give a man most satisfaction, but to answer this he finds it necessary to ask what is the characteristic function of man. The question is borrowed from the arts, and in them admits of an easy answer. There is no difficulty in seeing that the function of a flute-player as such is to play the flute or that that of an axe is to cut. With regard even to parts of the living body—the eye, the hand—it is easy to see what they are there to do. It is not so easy to see what is the work of man. Aristotle answers the question by considering what it is that *only* man can do. Growth and reproduction we share with animals and plants, sensation with animals; neither of these can be the characteristic work of man. But in man, as we have learnt from the *De Anima*, there is superimposed on these faculties a higher faculty, which Aristotle here calls τὸ λόγον ἔχον, 'that which has a plan, or rule.' Within this there is a sub-faculty which understands the plan, and one which obeys it. Happiness must be the life of this part of us. Secondly, it must be activity, not mere potentiality. Thirdly, it must be in accordance with virtue, or, if there is more than one virtue, with the best and most perfect of them. Fourthly, it must be manifested not merely for short periods but in a complete life.[2]

This definition is confirmed by common views about happiness, and at the same time improves on them. Some say happiness is virtue; we say it is that sort of action to which

[1] 1096 ᵃ11–1097 ᵃ14. [2] 1097 ᵃ15–1098 ᵇ8.

virtue is the tendency. Some say it is pleasure; we say that it is necessarily accompanied by pleasure. Some say it is external prosperity; we say that without a measure of prosperity a man cannot exercise the good activity which is happiness. Thus the main elements in the common notion of happiness are allowed for in our definition. Virtue is the spring from which good activity flows, pleasure its natural accompaniment, and prosperity its normal precondition;[1] though Aristotle is careful to add[2] that fine character may 'shine through' adverse circumstances.

Happiness being activity in accordance with virtue, Aristotle proceeds[3] to discuss the nature of virtue, the subject which occupies him to the end of Book VI. We have seen that besides reason proper, that part of us which can conduct an argument or make a plan, there is a part which can follow the plan. Being intermediate, this can be classed as part either of the reasonable or of the unreasonable element in us. Its actual nature is now revealed; it is the faculty of desire, that which in the self-controlled man obeys the rule of life which he sets before himself, but in the incontinent man disobeys it. There are thus two kinds of virtue—the virtues of the reasonable element proper and those of the intermediate element, the virtues of intellect and those of character. With the former Book VI., with the latter Books II.–V. are occupied. II.–III. 1115 ᵃ3 discusses the general nature of good character and good action; III. 1115 ᵃ4—IV. *fin.* discusses in detail the leading virtues recognised by the Greeks of Aristotle's day; Book V. discusses justice in still greater detail.

GOODNESS OF CHARACTER

Aristotle begins[4] by discussing how goodness of character is produced, in what material and in what way it is exhibited. It is neither natural nor unnatural to man; we start with a capacity for it, but this has to be developed by habit. It is not like the faculties of sense which are present, Aristotle assumes, full-grown from the start; as we learn to be builders by building or harp-players by playing the harp, we become just or temperate by doing just or temperate acts. 'States of character are formed from similar activities.'[5] The first rule

[1] 1098 ᵇ9–1099 ᵇ8.
[2] 1100 ᵇ30.
[3] 1102 ᵃ5–1103 ᵃ10.
[4] 1103 ᵃ14–1105 ᵇ18.
[5] 1103 ᵃ14–ᵇ25.

laid down with regard to these activities is that excess and defect are both to be avoided. As either excess or defect of exercise or of food is bad for the body, so if we fear everything we shall become cowardly and if we fear nothing we shall become foolhardy; in neither case will courage be developed in us. And the acts we do when we have acquired the virtue will have the same character of moderation as those from which the virtue is developed. Here [1] we have the germ of the doctrine of the mean; its discussion may be left till later.

The best indication of a man's internal disposition is his feeling pleasure or pain in the doing of virtuous or vicious acts. Pleasure and pain may indeed be called the subject-matter of moral virtue. The pursuit of pleasure, the avoidance of pain, are the main sources of vicious action. Virtue is concerned with actions and feelings, and all of these are accompanied by pleasure or pain. It is by pain that vicious action is corrected. Even the motives of action other than pleasure—the noble and the useful—bring pleasure in their train. The tendency to feel pleasure in certain objects is ingrained in us from our birth; we tend to judge all actions by their pleasantness or painfulness. It is harder to fight against pleasure than against anger, and victory over it is the essential object of virtue. We must not say, however, that virtue is freedom from pleasure and pain; the tendencies to feel pleasure and pain are not to be suppressed but to be moulded into the right shape. We must learn to take pleasure in the right way and at the right time. Aristotle neither praises nor condemns the tendencies inherent in man. They are indifferent in themselves; they become good or bad according as they are subjugated to or allowed to assert themselves against the 'right rule' which our reasonable nature grasps for itself and seeks to impose on them.[2]

A paradox is involved in Aristotle's assertion that we become good by doing good acts; how can we do good acts if we are not ourselves good? He proceeds to explain that there is a difference between the acts that create and those that flow from the good disposition. Even in the arts there is a partial parallel; it is possible to talk good grammar, for instance, without knowing the rules of grammar. But in the arts it is the doing the right thing that matters, whereas we do not say that a man is virtuous or acts virtuously unless he does the act (1) knowing what he does, (2) choosing the act, and

[1] ^{b}26–1104 ^{b}3. [2] 1104 ^{b}3–1105 ^{a}16.

for its own sake, and (3) as the result of a permanent disposition. Thus the paradox disappears; the actions that produce virtue are not in their inner nature but only in their external aspect like those that virtue produces. Aristotle here [1] lays his finger with precision on the distinction between the two elements involved in a completely good action—(1) that the thing done should be the right thing to do in the circumstances, and (2) that it should be done from a good motive.

The way is now clear for a definition of virtue. Its genus must first be ascertained. It must be one of three things—a feeling, a capacity, or a disposition. The distinction between virtue and vice on the one hand and things indifferent on the other is here pursued into greater detail. Virtue cannot be a feeling like appetite-for-pleasure, anger, fear; we do not call men good or bad, praise or blame them, for feeling these; nor do they involve choice; nor are they the maintenance of an attitude, but mere passive affections. Nor, for similar reasons, can virtue be a mere capacity. It must therefore be a disposition, developed out of a capacity by the proper exercise of that capacity.[2]

So far our account is equally true of vice; what is the differentia of virtue? In every divisible continuum there is a more, a less, and a mean amount. There is an objective or arithmetical mean equidistant between extremes. But there is also a mean 'relatively to us' which is different for different people. Ten pounds of food may be too much and two too little; it does not follow that six is the right amount for everybody. Every art and craft aims at a mean of this sort; nothing can be added to or taken from the perfect work of art without destroying it. Similarly moral virtue will aim at the mean both in feeling and in action, and hence it may be defined as 'a disposition to choose, consisting essentially in a mean relatively to us determined by a rule, i.e. by the rule by which a practically wise man would determine it.' [3]

The meaning of the last part of this definition of virtue may be left till we come to Book VI., where practical wisdom is discussed. We need only notice now that the definition of moral virtue involves a reference to an intellectual virtue. Moral virtue is not complete in itself. To be morally virtuous you must either have practical wisdom yourself, or follow the example or precept of someone who has; for it is by applying

[1] 1105 a17–b18. [2] b19–1106 a13.
[3] 1106 a14–1107 a2.

general principles by a reasoning process to the circumstances of the particular case that the right action is determined. We shall see later[1] that moral virtue in its full sense implies the possession of practical wisdom by the virtuous man himself. The other new element in the definition, the reference to the mean, may be considered now. This, it must be remembered, is for Aristotle what differentiates virtue from vice. In respect of excellence, no doubt, virtue is an extreme, but 'in respect of its essence and its definition it is a mean.'[2] Aristotle is not simply advising us to play for safety by avoiding extremes; there is much more of a theory behind his definition than there is behind a mere *medio tutissimus ibis*. We have already seen in part what the theory is. It is in effect a protest against the ascetic, Manichaean view which condemns all natural impulses, and equally against the naturalistic view which elevates them above criticism and adopts them as the guide of life. None of them is good and none bad in itself; there is a right amount of each, a right time, a right manner, right objects for each. It is doubtful, however, whether the doctrine of the mean is the correct way of expressing this sane and true view. (1) In so far as virtue involves a certain intensity of feeling, or the spending of a certain amount of money, or the like, there is some appropriateness in describing it as a mean. But the time, the object, the manner must also be right, and Aristotle's attempt to apply a quantitative notion like the mean to these elements in right action is by no means successful. (2) It is not always the case that the right action is in a mean. Even granting that the instinctive feelings are in the abstract indifferent, there are occasions on which a particular feeling should be entirely suppressed and others on which a particular feeling should be followed to the uttermost. It seems to be an accident, though a very frequent accident, of right action that it should be intermediate between extremes. (3) The essential thing is not that feelings should have some particular intensity, but that they should be thoroughly subjugated to the 'right rule' or, as we might say, to the sense of duty. But Aristotle meets this objection by the latter part of his definition. (4) Even in the light of Aristotle's disclaimer of the suggestion that any mere arithmetical calculation will tell us what we should do, to describe virtue as essentially a mean suggests that we first know the extremes and from them infer the mean. There are probably cases in which this is so. If I am considering

[1] 1143 ᵇ18–1145 ᵃ11. [2] 1107 ᵃ6–8.

what I should subscribe to a charity, I may start by seeing that a subscription of £100 is beyond my means and that one of half-a-crown would be stingy,[1] and it may be by working inwards from these limits that I finally decide what it would be right to give. But it would be a mistake to put this forward as an account of the way in which we always or normally decide what we should do. More often there is no such process of approximation; we recognise what is too much and what is too little by recognising what is right.

Yet the theory has value as a recognition of the necessity of introducing system, or as Aristotle says,[2] symmetry, into the manifold tendencies which exist within us. It is a quantitative notion, but good action has its quantitative side; it must be not too little and not too much. The Greeks were right in holding that to produce *anything* good of its kind—a healthy body, a beautiful work of art, a virtuous action—certain quantitative relations are required; quality rests on quantity. As applied to virtue the doctrine is not, perhaps, very illuminating, but there is an element in it which is true.

Aristotle proceeds to guard against misconception by pointing out that not all nameable feelings or actions admit of a mean; the very names of some, e.g. shamelessness, envy, adultery, theft, murder, imply their badness. I.e. these are names not for the morally indifferent feelings which are the subject-matter of virtue, but for wrongful excesses or deficiencies of these feelings; not for actions dealing with a certain class of object but for *wrongful* actions dealing with such a class. Shamelessness is a wrongful deficiency of shame; theft a wrongful excess in the acquisition of wealth. The mean is opposed to excess and deficiency, and therefore there is no mean *of* an excess or a deficiency, as there is no excess or deficiency *of* a mean.[3]

The doctrine of the mean is next[4] illustrated by a brief review of the chief virtues and vices. This is repeated later in greater detail and may more conveniently be examined when we reach the section III., 1115 a4—V. *fin.* Aristotle adds[5] that opposite vices are more opposed to one another than to the virtue which lies between them. This view was criticised by Kant on the ground that there is a greater difference between the

[1] I owe the illustration to Professor J. A. Smith.
[2] 1104 a18. [3] 1107 a8–27. [4] a28–1108 b10.
[5] 1108 b11–1109 a19.

moral motive and all others than between any two of the others, and that in fact the transition from vice to vice is much easier than that from vice to virtue. The miser and the spendthrift are alike lacking in the right attitude towards money, and hence the man who is a spendthrift in his youth is more likely to be a miser in his old age than to use his money rightly. The criticism is justified; it is only in their external aspect, in the thing done as opposed to the state of mind of the doer, that the vices are more opposed to one another than to virtue.

Finally Aristotle points out that the virtue is sometimes nearer to the excess and sometimes to the defect, and this for two reasons. In some cases this result arises from the very nature of the facts; courage is in its nature more opposed to cowardice than to rashness. In others it arises 'from ourselves'; the virtue is not liker one vice than the other, but we tend to oppose it to the vice to which we are more prone; thus we oppose temperance more to profligacy than to the opposite vice. From this follows the practical advice to beware (1) of the vice which is the more opposed to the corresponding virtue, and (2) of the vice to which we are the more prone and in which we take the greater pleasure. But after all no general rule will help us very much to know what we ought to do; we must wait till we are in the particular circumstances, and take account of them all; 'the decision lies with perception.'[1]

Voluntary Action and Choice

Aristotle now turns to consider the conditions under which a man is held responsible for his action. It is only for voluntary actions that men are praised or blamed. Actions are involuntary if they are due either to compulsion or to ignorance. *Compulsory* actions are those in which the origination is from without, the agent (or rather the patient) contributing nothing thereto, i.e. in which the body is acted on by an irresistible external force. Actions done from fear of a greater evil, such as the jettisoning of cargo in a storm, might be thought to be compulsory, and may be called 'mixed actions,' but are more akin to voluntary action. Described abstractly as the jettisoning of cargo, such an action is one which no sane man would voluntarily do, but it is with particular actions in particular circumstances that morality is concerned, and in its actual

[1] 1109 a20–b26.

circumstances such an act is one which no one need be ashamed to take responsibility for; it is plain, too, that the actual origination of the bodily movement comes from the man himself. Such actions are sometimes praised; sometimes, when a man does what he should not, owing to fear of pains which no one could endure, they are pardoned; but there are some acts to which even death is held to be preferable, and which therefore are not pardoned on any such plea. Nor, again, can it be argued that all acts done for the sake of pleasure or for noble objects are compulsory, as due to something external to us. At that rate all actions would be compulsory; further, the pleasure which attends such acts shows them not to be compulsory; their cause is in the agent himself.

With regard to the other source of involuntariness, viz. *ignorance*, certain distinctions are drawn. (1) If the action done through ignorance is subsequently regretted, it is involuntary; if not, it can only be called non-voluntary. This distinction is not satisfactory. There is no real difference of meaning between 'involuntary' and 'non-voluntary.' It might be suggested that by *ἀκούσιον* Aristotle means 'unwilling' and by *οὐχ ἑκούσιον* 'involuntary'; but it is clear that unwilling and merely involuntary acts cannot be differentiated by the agent's subsequent attitude. (2) The man who acts under the influence of drink or of rage acts in ignorance but not owing to ignorance. Ignorance is the proximate cause, but the ignorance is itself due to drink or rage. Generalising, we may say that all bad men act *in* ignorance of what they ought to do, but their actions are not therefore involuntary. The second distinction leads to a third. (3) The ignorance which makes an action involuntary is not ignorance of what is good for us; this 'ignorance in the choice' or 'universal ignorance' is the condition not of involuntary action but of badness. The ignorance that exculpates is ignorance of the particular circumstances. Action is voluntary, then, when (1) its origin is in the agent, and (2) he knows the circumstances in which the act is done.[1]

The notion of *προαίρεσις*, preferential choice, has already occurred in the definition of virtue. Aristotle now proceeds to explain it. Choice is evidently not co-extensive with voluntary action. The actions of children and the lower animals, and again actions done on the spur of the moment, are voluntary but not chosen. Choice had been identified by other thinkers

[1] b30–1111 b3.

with some form of desire—appetite, anger, or rational wish—or with a particular kind of opinion; but Aristotle has little difficulty in distinguishing it from all of these. It is most like rational wish, but (1) we may wish for what is impossible, but cannot choose it. (2) We may wish for something that does not depend on our own action, but we cannot choose it. (3) Wish is of the end, choice of the means. It is finally suggested that the object of choice is that which has been decided upon by deliberation.[1] Now deliberation is about what is in our own power and can be done. It is about means, not ends; it presupposes a determinate end and considers how this can be attained. And, having worked back from end to means, it goes further back to the means to the means and continues till it has reached a means that can be adopted here and now. Its procedure can be compared to that of the mathematician who works back from the problem to be solved to a simpler problem whose solution would enable him to solve the other, and so on till he comes to one which he can solve with the knowledge already at his disposal; 'the last step in the analysis is the first to be taken in fact.' I.e. deliberation is like the process of mathematical discovery, as opposed to that of deductive exposition. As it is limited at its beginning by something other than itself, i.e. desire of a determinate object, it is limited at its other end by something other than itself, viz. perception of the actual circumstances. The whole process may be formulated thus:

Desire	I desire A.
Deliberation	B is the means to A. C is the means to B. ⋮ N is the means to M.
Perception	N is something I can do here and now.
Choice	I choose N.
Act	I do N.

Thus choice is 'deliberate desire of things in our own power,'[2] or, as Aristotle puts it elsewhere,[3] 'it is either desireful reason or reasonable desire, and that sort of origin of action is a man.'

It has often been complained that the psychology of Plato and Aristotle has no distinct conception of the will. Aristotle's doctrine of choice is clearly an attempt to formulate such a

[1] 1111 ^{b}4–1112 ^{a}17. [2] 1112 ^{a}18–1113 ^{a}14. [3] 1139 ^{b}4.

conception. Some of the features of his doctrine are a great advance on any previous thought on the subject—the distinction of choice from appetite and rational wish; the limitation of it to things neither necessary nor impossible but within (we should rather say, thought of as within) our own power; the recognition of it as implying both desire and reason, and not merely desire + reason, but desire guided by reason and reason fired by desire. His definition of it as deliberate desire errs by treating it as one kind of desire, which it plainly is not; but his statement that it may be called either desireful reason or reasonable desire implies that desire is not its genus, that it is a new thing different from either of its preconditions. One further point may be noted: Aristotle declares choice to be of means, not of end. This is a limitation not naturally suggested either by the Greek or by the English word; there may be a choice between ends no less than between means. In fact outside the two passages in which *προαίρεσις* is formally discussed [1] it hardly ever refers to the means.[2] Both in the remainder of the *Ethics* and in Aristotle's other works it generally means 'purpose' and refers not to means but to an end.[3] The specific doctrine of *προαίρεσις* is an integral part of Aristotle's theory, but has little effect on his general usage of the word.

Virtuous activities being not only voluntary but in accordance with choice, it follows that virtue and vice are in our own power. Socrates' saying 'no man is willingly bad' is untrue, unless we are prepared to say that man is not the source and begetter of actions. No one would ever try to persuade a man not to be cold or hungry, since this is not in his power; but legislators try to persuade people by reward and punishment to act virtuously, clearly implying that virtue and vice *are* in our power. They even treat ignorance of which a man is himself the cause as no excuse for wrongdoing. If a man says he did not know the law, we answer 'you ought to have taken

[1] 1111 b4–1113 a14, 1139 a17–b13.

[2] The only passages in which it seems distinctly to do so are *Met.* 1025 b24, *E.N.* 1145 a4, 1162 b36, *Rhet.* 1363 a19.

[3] The clearest instances are *Top.* 172 b11; *Meteor.* 339 a9; *Met.* 1004 b25; *Pol.* 1269 b13, 1271 a32, 1301 a19, 1324 a21; *Rhet.* 1355 b18, 1374 a11, b14; *E.N.* 1102 a13, 1110 b31, 1111 b5, 1117 a5, 1136 b15, 1151 a7, 30, 1152 a17, 1163 a22, 1164 b1, 1179 a35 and especially 1144 a20. Some of these passages are not absolutely decisive in themselves, but the cumulative evidence is irresistible.

care to know it.' If he says he is constitutionally careless about such things, we answer 'yes, but you have become so only by your dissolute living; it is only by a course of action that character is produced.' It was in the power of the vicious man not to become vicious; but it does not follow that he can now cease to be so.

Another attempt may be made to escape responsibility for action. It may be said that, while all men seek their apparent good, they are not responsible for what appears good to them. To this Aristotle replies that if, as we have seen, 'a man is somehow responsible for his moral state, he is somehow responsible for what appears good to him; while if he is not, virtue is no more voluntary than vice, each man's end being determined for him not by choice but by nature or in some other way.'[1] This is perhaps the nearest approach in Aristotle to a discussion of free will, and the result is somewhat inconclusive. It is not so much an assertion of free will as a reply to those who would avoid responsibility for wrong actions while taking credit for good ones. In reviewing Aristotle's general attitude towards free will the following points have to be borne in mind: (1) The doing of a particular act follows (so he sometimes maintains) necessarily from the apprehension of the appropriate premises. 'If everything that is sweet ought to be tasted, and this particular object is sweet, a man who can taste it and is not prevented must forthwith do so.'[2] (2) When character has once been established, it cannot be changed at will.[3] (3) 'Voluntary' does not for Aristotle connote anything amounting to freedom of will, for it is applied to the behaviour of animals.[4] On the other hand it must be noted that (1) Aristotle seems to believe in an objective contingency which is not a mere euphemism for our ignorance of the future. He had no clear conception of a universal law of causation.[5] (2) He takes up a decided stand against the Socratic view that no one is willingly bad, that action follows necessarily on our state of belief.[6] On the whole we must say that he shared the plain man's belief in free will but that he did not examine the problem very thoroughly, and did not express himself with perfect consistency.

[1] 1113 ^{b}3–1115 ^{a}3.
[2] 1147 ^{a}26–31, cf. 1139 ^{a}31–33.
[3] 1114 ^{a}12–21, 1137 ^{a}4–9.
[4] 1111 ^{a}25, ^{b}8.
[5] *De Int.* 18 ^{a}33–19 ^{b}4; *Met.* 1027 ^{b}10–14, cf. pp. 80 f., 164.
[6] 1113 ^{b}14–17, 1144 ^{b}17–30, 1145 ^{b}22–28.

The Moral Virtues

Aristotle now proceeds to illustrate and test his theory of virtue, and in particular the doctrine of the mean, by a detailed examination of the virtues. They are said to be concerned with feelings and actions. Their scope is defined sometimes by reference to a type of feeling, sometimes by reference to a type of action, but this is only a matter of convenience ; a virtue is a tendency to control a certain class of feeling and to act rightly in a certain kind of situation. The list of virtues [1] may be summarised as we have shown them on the opposite page. Thus we have (1) three virtues consisting in the right attitude towards the primitive feelings of fear, pleasure, anger,[2] (2) four virtues concerned with two of the main pursuits of man in society—the pursuit of wealth and that of honour, (3) three virtues of social intercourse, (4) two qualities which are not virtues since they are not dispositions of the will. These last are intermediate states and are praised, but they are mean states of feeling, not attitudes of will towards feeling. They are ingeniously treated in the *Eudemian Ethics* [3] as the instinctive qualities out of which temperance and justice respectively are developed. The account of the opposites of righteous indignation in the *Nicomachean Ethics* [4] is hopelessly confused, and in Book IV. this 'mean of feeling' does not appear at all.

This part of the *Ethics* presents a lively and often amusing account of the qualities admired or disliked by cultivated Greeks of Aristotle's time. The method adopted is the very reverse of that followed by Plato. Plato (in the *Republic*) takes the four cardinal virtues recognised in his day—wisdom, courage, self-control, justice,—and interprets them so widely that each is in danger of overlapping the others, and two of them—wisdom and justice—tend to be almost identified with virtue as a whole. In Aristotle the spheres of the several virtues are strictly narrowed down, and we are enabled all the better to estimate the widening and spiritualising of moral ideals which the centuries since Aristotle have brought with them. No attempt is made at an exhaustive logical division of either feelings or actions. The order is haphazard ; two of

[1] 1107 ^{a}28–1108 ^{b}10, 1115 ^{a}4–1128 ^{b}35.

[2] Courage and Temperance are treated first because they are the virtues 'of the irrational parts,' 1117 ^{b}23.

[3] III. 7.

[4] 1108 ^{a}30–^{b}6.

Feeling.	*Action.*	*Excess.*	*Mean.*	*Defect.*
Fear		Cowardice	Courage	Unnamed
Confidence		Rashness	Courage	Cowardice
Certain pleasures of touch (Pain arising from desire for such pleasures)		Profligacy	Temperance	Insensibility
	Giving of money	Prodigality	Liberality	Illiberality
	Taking of money	Illiberality	Liberality	Prodigality
	Giving of money on large scale	Vulgarity	Magnificence	Meanness
	Claiming of honour on large scale	Vanity	Self-respect	Humility
	Pursuit of honour on small scale	Ambitiousness	Unnamed	Unambitiousness
Anger		Irascibility	Gentleness	Unirascibility
• Social intercourse	Telling the truth about oneself	Boastfulness	Truthfulness	Self-depreciation
	Giving of pleasure— By way of amusement	Buffoonery	Wittiness	Boorishness
	In life generally	Obsequiousness	Friendliness	Sulkiness
	Mean states of feeling			
Shame		Bashfulness	Modesty	Shamelessness
Pain at good or bad fortune of others		Envy	Righteous indignation	Malevolence

the cardinal virtues are treated first and in considerable detail (the other two being reserved for treatment in Books V. and VI.); the other virtues are taken up just as they occur to Aristotle's mind, one no doubt suggesting another as he proceeds. Two special points to be noted in the description of the virtues are (1) the light which it throws on the doctrine of the mean, and (2) the intrusion of non-moral elements, of which the accounts of 'magnificence,' self-respect (μεγαλοψυχία) and wittiness afford the best evidence. Magnificence, for example, turns out to be mainly a matter of æsthetic good taste. These points will be sufficiently illustrated if we consider the account of courage, temperance, and self-respect.

(1) Courage. All evils are naturally feared, but some (such as evil reputation) it is right to fear; the control of such fear is obviously not courage proper. Others (such as poverty, disease, insult to one's family, envy) perhaps ought not to be feared; but the control of such fears, again, is not in the strict sense courage. Courage must be concerned with the most terrible of all evils, namely death; with death, however, not in all circumstances, e.g. at sea or by disease, but in the most noble circumstances, i.e. in battle. The courageous man is he who does not fear a noble death. He will in point of fact be brave at sea or in sickness, but in such circumstances there is no scope for action and no nobility in death.[1]

The courageous man will feel fear but he will control it; he will face danger 'as he ought and as the rule commands, for the sake of the noble (τοῦ καλοῦ ἕνεκα), the noble being the end of virtue.'[2] There is an ambiguity in the Greek expression just quoted. It may mean 'because the action, the facing of danger, is itself noble.' Or it may mean 'for the sake of the noble object to be attained.' The latter way of speaking is that which is called for by Aristotle's view of action as aiming at an end other than itself—as aiming, in the last resort, at the theoretical life, which is the end for man—and by his account of moral choice as the choice of means to an end. But the phrase is paraphrased several times[3] in the former and never in the latter sense, and it seems clear that in the actual treatment of the virtues Aristotle somewhat forgets his formal view; he nowhere attempts to deduce the necessity of any single virtue from the supreme end to be attained. He treats the agent as being moved to action by the contemplation of the

[1] 1115 a6–b6. [2] b7–1116 a15.
[3] 1116 a11, 15, b3, 1117 a17, b9.

'fineness' of the good act itself, and thus becomes in his detailed treatment an intuitionist. The formal theory remains in the air, and we are left with the impression that when Aristotle came face to face with the facts of morals he felt its inadequacy.

There are, Aristotle continues, five kinds of courage other than moral courage proper. There is (*a*) political courage, the courage which faces danger to gain the honours and to escape the degradations assigned by law to courage and cowardice respectively. This is most like true courage because its motive is a noble one, viz. honour. A lower form of political courage is that in which the motive is the fear of punishment. There is (*b*) the courage of experience, such as is shown by professional soldiers. When they once lose the confidence born of experience they are more likely to play the coward than the citizen soldiers previously described. There is (*c*) the courage inspired by anger or by pain, which is akin to that shown by the brutes. This is the 'most natural' kind of courage; if choice and the right purpose be added it develops into courage proper. There is (*d*) the courage of a sanguine temperament. When once hope has been disappointed, such courage soon disappears because it has not the right motive. (*e*) There is the courage of ignorance, which is even less enduring than the previous kind.[1]

Though courage is a proper attitude towards the feeling of confidence as well as towards that of fear, it is most conspicuously shown in circumstances that inspire fear; it is essentially the facing of what is painful. Its end indeed is pleasant, but this is overshadowed by the pains that attend it. Indeed, Aristotle admits, virtuous activities generally are pleasant only in so far as the end is attained;[2] there is no such pre-established harmony between virtuous activity and pleasure as the account of happiness in Book I. too readily assumed.

The first thing, perhaps, that occurs to us in considering this account is that it is unnatural to oppose courage to rashness as well as to cowardice. The opposite of courage is cowardice, and the opposite of rashness discretion. We might be disposed to think that the difference between the two latter is an intellectual and not a moral difference, and that Aristotle is trying to bolster up his doctrine of the mean by representing an intellectual defect as if it were a moral vice related to courage on the one side as cowardice is related to it on the other. And

[1] 1116 ^{a}15–1117 ^{a}28. [2] 1117 ^{a}29–^{b}22.

generally, we may say, the trinitarian scheme of virtues and vices is mistaken ; each virtue has but one opposite vice ; the opposite of temperance is intemperance, that of liberality meanness, that of proper pride lack of self-respect, that of good temper bad temper, that of justice injustice. Must this not be so from the nature of the distinction between virtue and vice ? Vice is passive obedience to natural instinct, virtue the controlling of instinct by sense of duty or by some other high motive—as Aristotle says, by the rule discerned by reason. There can be too little of such control but there cannot be too much. Yet there is more in Aristotle's view than this criticism allows for. What he has seen, though he has not expressed it very well, is that, in many cases at all events, natural reactions to stimulus go in pairs of opposites. There is not only a tendency to avoid danger, but a tendency to rush into it—a tendency less common than the other, but one which exists and which no less than the other must be mastered 'for the sake of the noble.' One soldier must not be the slave of his 'cheer,' as this tendency has been called,[1] any more than another should be the slave of his fear. Both alike must follow the rule. For Aristotle's trinity we must substitute not one duality but two, which we may represent thus :—

Feeling	*Virtue*	*Vice*
Fear	Courage	Cowardice
Love of danger	Discretion	Rashness

Similarly with regard to money we have

Feeling	*Virtue*	*Vice*
Hoarding instinct	Liberality	Meanness
Spending instinct	Thrift	Prodigality

Externally the virtuous action is a mean between extremes, but it is different impulses that have to be overcome in avoiding the two extremes, and internally courage is quite a different thing from discretion, liberality from thrift. We have not space to apply this analysis to other cases, but in several it is certainly applicable.

The other point to be noticed in the account of courage is the very great narrowing of its scope. Aristotle mentions a

[1] J. L. Stocks, *The Test of Experience*, in *Mind* XXVIII. (1919), 79–81.

wider sense of the word in which it is applied to people who do not fear, e.g., disgrace or loss of wealth, but he rejects this as not courage proper.[1] Yet it would be a mistake to say that he means by courage mere physical courage. The courage which is purely instinctive is described as being nothing more than a germ from which true courage may be developed; for its development the true motive must be added; we must face danger not because we like it, but because it is noble to do so. In another sense of the term 'physical,' physical courage *is* the only kind which he recognises; the fear we must control is fear of physical evil, and strictly it is only the fear of death in battle. The courage of the seaman or the explorer is excluded. The conclusion is, of course, unjustifiable; it is explicable, however, if we remember that these are not facing death for their country, as the soldier is. It is the greatness of the end to be attained, the safety of the state, that for Aristotle makes the soldier's death uniquely noble, though he does not explicitly refer to this end, but merges it in the nobility of the action.

(2) Temperance. The scope of this virtue is similarly narrowed. It is said to be concerned with pleasures and pains, but is in effect confined to the former. Mental pleasures are first excluded; we have other names than 'profligate' for men who are slaves to these. The pleasures of sight, hearing, smell are also excluded; temperance is concerned only with those senses in which the lower animals as well as man take a direct delight, viz. touch and taste. Nor are all the pleasures of touch and taste included, but only the most purely animal, those of eating, drinking, and sexual intercourse.[2] The only pains with which temperance is concerned are those due to unfulfilled desire for such pleasures.[3]

Apart from the excessive narrowness of the conception of temperance, the main point to be noted here is the breakdown of the doctrine of the mean. The vice of defect, it is admitted, has no name, and indeed hardly exists. The only thing that can be opposed to self-control is lack of self-control, and in this case there is only one instinct to be controlled, the instinct to seize the pleasures in question. There is here no *vice* of defect; the 'defect' can only be either an innate insensibility for which one cannot be blamed, or asceticism, which is not enslavement to instinct but subjugation of instinct to a rule, though perhaps not to the 'right rule.'

[1] 1115 a14–24. [2] 1117 b23–1118 b8. [3] 1118 b8–1119 a20.

(3) 'Great-souledness,' or, as we may call it, proper pride, or self-respect, occupies a special place in the list of the virtues. The great-souled man is he whose deserts and claims are alike great. This virtue therefore presupposes the others, and enhances them; it is 'a sort of crown of the virtues.' What the great-souled man claims is honour, but even great honours and even those conferred by good men will give him but moderate pleasure, since he is at most only getting his own; still he will accept them as the best that his fellow-citizens have to give. Honour from the common run of men he will despise, and dishonour no less. If he has high birth, power, or wealth, these increase his sense of his own value. He is no lover of danger, but in the face of great danger will not spare his life, thinking that life can be kept at too dear a price. He is ready to confer benefits, ashamed of receiving them and thus putting himself in the position of an inferior; he requites benefits with greater benefits so as to make his friend his debtor. He remembers those whom he has benefited but forgets his benefactors; he likes to be reminded of the benefits he has conferred but not of those he has received. His demands upon others are few, his readiness to serve great. He bears himself proudly towards the great, courteously towards those of middle condition. He does not rush in where honour is to be won, or where others take the lead. He is slow to act except where there is something great to be done. He is open in love and hatred, in speech and action; unready to live at the will of another, except of a friend; not apt to admire; not ready to remember evil; no gossip nor back-biter; does not grieve over small things; prefers beautiful and useless possessions. His step is slow, his voice deep, his speech sedate.[1]

There are admirable traits among those here depicted, but as a whole the picture is an unpleasing one; it is an anticipation of the Stoic sage without his self-abasement before the ideal of duty. The offensiveness of the picture is mitigated, but not removed, if we remember that the man who behaves like this is supposed to have, to start with, the highest possible merits. Nor can we fairly suppose that the account of this virtue, unlike that of the others, is ironical, or is a mere exposition of popular views. The passage merely betrays somewhat nakedly the self-absorption which is the bad side of Aristotle's ethics.

[1] 1123 a34–1125 a35.

Justice

Of Plato's four cardinal virtues, justice and wisdom remain for treatment. To justice Book V. is devoted.[1] Aristotle begins[2] by recognising two senses of the word. By 'just' we may mean (1) what is lawful or (2) what is fair and equal; these are 'universal' and 'particular' justice respectively. The first of these meanings is not one which we should naturally assign to the word 'just'; it is to be explained partly by the fact that *δίκαιος* meant originally 'observant of custom or rule' (*δίκη*) in general.[3] In later Greek, justice tends to be identical with the whole of righteousness.[4] In particular, *ἀδικεῖν* was the word used in Attic law to express any breach of law. As the defendant in a civil suit is charged with wronging an individual, the prisoner in a criminal case is thought of as wronging the city. Aristotle thinks that the law should control the whole range of human life and enforce, not indeed morality, since it cannot secure that men shall act 'for the sake of the noble,' but the actions appropriate to all the virtues; if the law of a particular state does this only partially, that is because it is only a rough and ready adumbration of what law should be.[5] Justice in this sense, that of obedience to law, is thus co-extensive with virtue, but the terms are not identical in meaning; the term 'justice' refers to the social character which is implied in all moral virtue but to which the term 'virtue' does not call attention.

His main interest, however, is in 'particular justice.' The man who is 'not just,' in this sense is the man who takes more than his share of the things which are good in themselves, but not always good for a particular person, i.e. external goods such as wealth and honour. The man who runs away in battle or loses his temper may be said to be unjust in the wider sense, but not to be grasping; graspingness is evidently a particular vice to be distinguished from others, and to this vice the name 'injustice' is in particular assigned. Particular justice is

[1] On Aristotle's treatment of justice and its connexion with Greek practice, cf. Vinogradoff, *Outlines of Historical Jurisprudence*, II. 43–71.

[2] 1129 ᵃ3–1130 ᵃ13.

[3] Cf. Hom. *Od.* 3, 52, where Peisistratus is 'just' because he hands the wine-cup first to Athene; and so frequently in Homer.

[4] Cf. the proverbial 'in justice is all virtue found in sum,' quoted in 1129 ᵇ29.

[5] It is particularly on the *education* established by law that Aristotle relies for the production of virtue, 1130 ᵇ25.

divided into two kinds, justice in the distribution of honour and wealth among the citizens, and remedial justice in the relations between man and man.[1] In both of these, as well as in a third kind introduced by an afterthought, Aristotle aims at showing that justice is the establishment of a kind of ἀναλογία (which means primarily 'proportion' and includes certain other numerical relations as well),[2] and at the same time that the three kinds of justice establish different kinds of ἀναλογία, not always, as Plato had said,[3] proportion, nor, as the Pythagoreans had said, reciprocity.

Distributive justice involves two persons and two things, and its task is, given a certain good to be distributed, to divide it in a ratio C : D equal to the ratio of merit between two persons A and B between whom it is to be divided. Merit is, however, estimated differently in different states; in democracy freedom is the standard and all freemen are deemed equal; in oligarchy the standard is wealth or noble birth, in aristocracy virtue. If, now,

$$A : B = C : D, \text{ then}$$
$$A : C = B : D, \text{ and therefore}$$
$$A + C : B + D = A : B.$$

I.e. if C is given to A, and D to B, the relative position of the parties is the same as it was before the distribution, and justice will have been done. Justice is thus a mean between giving more to A than his share and more to B than his.[4]

The account of distributive justice sounds somewhat foreign to our ears; we are not in the habit of regarding the state as distributing wealth among its citizens. We think of it rather as distributing burdens in the form of taxation. In Greece, however, the citizen regarded himself, as has been said,[5] as a shareholder in the state rather than as a taxpayer; and public property, e.g. the land of a new colony, was not infrequently divided among them, while public assistance to the needy was also recognised. Aristotle seems also to have in mind the distribution of profits between partners in proportion to what they have put into their business;[6] and the division of an

[1] 1130 b14–1131 a9.

[2] Originally the Greeks seem to have recognised three means (μεσότητες), the arithmetical, the geometrical, and the harmonic, and only one ἀναλογία, the geometrical. Later, they applied ἀναλογία to all three cases. Cf. Heath, *The Thirteen Books of Euclid's Elements*, II. 292.

[3] *Gorg.* 508 a.; *Laws* 757 a, b. [4] 1131 a9–b24.

[5] J. Burnet, *ad loc.* [6] 1131 b29.

inheritance would equally come under his principle. By distribution of honour, Aristotle means the distribution of office in accordance with the underlying 'hypothesis' of the particular state that free status, wealth, noble birth, or virtue is to be the standard. This conception plays a large part in the *Politics*.[1]

Remedial justice is subdivided into (1) that in voluntary transactions, such as selling, lending, and (2) that in involuntary transactions, involving either fraud or force, such as theft, assault. The distinction between voluntary and involuntary transactions is that in the former 'the beginning of the transaction is voluntary,' i.e. the person who is subsequently injured has initially entered into a voluntary contract. The two classes of injustice answer to the distinction between breaches of contract, and delicts or torts; in both cases the injury is regarded as done to an individual, and in both the judge's object is not to punish but to give redress. The 'involuntary transactions' Aristotle mentions are in point of fact, most of them, crimes as well, and would in modern systems of law usually be dealt with by criminal prosecution; but they are often actionable at civil law as well, and it is in this light that Aristotle regards them,[2] in conformity with Greek practice.

Remedial justice is said to work not, like distributive justice, in accordance with geometrical proportion but with 'arithmetical proportion'; as we should say, not a proportion but an arithmetical progression is involved. There is no question of ascertaining the ratio of merit between two persons; the law does not ask whether a good man has defrauded a bad man or *vice versa*, but treats them as equal. It looks only to the specific nature of the injury, which includes a reference to the status of the parties and to the voluntariness or involuntariness of the act;[3] it takes account of 'moral and intellectual damages' as well as of physical or financial injury. The parties are regarded as having gained and lost respectively, the terms 'gain' and 'loss' being extended from commercial transactions to others. The parties after the injury are in the position of $A + C$, $B - C$, A being treated as $= B$. What the judge does is to take C from A and give it to B, thus putting each in a

[1] *Pol.* III. 9, V. 1.

[2] Regarded as crimes, as offences against the state and not against an individual, they would be instances of 'universal,' not of 'particular,' injustice.

[3] Cf. 1132 ^{a}2 with ^{b}28.

position which is the arithmetical mean between that of gain and that of loss. And, as in distributive justice, the relative position of the parties (here one of equality) is preserved, for (A being = B) $A + C - C = B - C + C$.[1]

The Pythagoreans had defined justice as 'reciprocity,' i.e. that A shall have done to him what he has done to B—in other words, 'an eye for an eye and a tooth for a tooth.' This simple formula does not apply, Aristotle points out, either to distributive or to remedial justice, but there is a third kind—justice of exchange or commercial justice—in which it applies if we make it 'reciprocity in accordance with a proportion' instead of 'reciprocity on a basis of equality.'[2] Reciprocity is necessary, to hold the state together; for it is held together by exchange of services, and people will not exchange if they do not get as good as they give. But simple reciprocity, a day's work for a day's work, will not do, for the exchanging parties are of different worth. They, and their products, must be equated before exchange takes place. We want, therefore, a unit in terms of which their products can be valued. The true unit is demand, which is what brings people together. But A, whose product B wants, may not want B's product, or not want it when B wants his. To avoid the fluctuation in exchange-value arising from this, money, which is a 'conventional representative of demand,' a 'guarantee that if you do not want something in exchange now, you can get it when you want it,' has been introduced. Money is itself subject to fluctuation of value, but less so than other goods.[3] If, now, a house is worth five minae and a bed one mina, we know that a

[1] 1131 b25–1132 b20. I find myself unable to accept the view held by Prof. Burnet and (haltingly) by Grant, that 'diorthotic' justice regulates rightful transactions as well as giving redress for wrongful ones. Nor do I think Aristotle distinguishes between the amount of A's gain and that of B's loss, i.e. of A's wrongdoing and B's injury, though no doubt in fact A may do B more or less harm than he meant to, and Greek law (as well as Plato's *Laws*, 767 e, 843 cd, 862 b, 915 a) to some extent took account of this.

[2] 'Reciprocal proportion' is not treated in Greek mathematics as a third kind alongside of geometrical and arithmetical; the third kind is 'harmonic proportion.' 'Reciprocal proportion' (ἀντιπεπονθέναι, cf. [Ar.] *Mech.* 850 a39; Euc. *El. VI.* 14, 15, *XI.* 34) involves simply a rearrangement of the terms of a geometrical proportion. If $A : B = C : D$, A, B are said to be in geometrical proportion to C, D, and A, D in reciprocal proportion to B, C.

[3] The other great advantage of money, its portability, is noted in *Pol.* 1257 a34.

house is worth five beds, so that if 'cross-conjunction' takes place accordingly, i.e. if A (a builder) gets D (five beds) from B (a maker of beds), and B gets C (one house) from A, there will be 'proportional reciprocity' (i.e. reciprocity which takes account of the comparative skill of the parties and the comparative worth of their products), and the exchange will be a fair one. This notion of money as facilitating barter, instead of (practically) driving it out of the field, is a curious one; but it must be remembered that in economics, as in so many other fields, Aristotle was the earliest worker, and if allowance be made for the fact, this chapter together with some in the *Politics* [1] will be seen to form a remarkable contribution to the subject.

The three types of person, then, whom Aristotle describes as acting justly are (1) the statesman, in distributing honours and rewards, (2) the judge, in assessing damages, (3) the farmer or manufacturer, in exchanging his goods at a fair price. And further, since breaches of contract and torts are instances of injustice, fulfilment of contracts and the refraining from tortious conduct are instances of justice. Aristotle has covered fairly completely the range of action to which the words 'just' and 'unjust' are applicable. But he does not point out a difference which exists between the various types. Whether the statesman and the judge act justly, whether the private citizen fulfils his contracts and refrains from invading the rights of other people, depends on their own volition. They may be subject to various temptations to act unjustly, and their just action may fairly be called virtuous. But there is no moral virtue in commercial justice as described by Aristotle. 'Justice' here is not a virtue but a sort of 'governor' in the economic machine which keeps exchange prices from swinging far from the actual value, for human needs, of the goods exchanged. It may have been a sense of this difference that led Aristotle not to recognise commercial justice as one of the primary types of justice but to bring it in only as an afterthought.

The discussion has made it clear, Aristotle says, that just action is a mean between acting unjustly and being unjustly treated. This is inconsistent with the previous discussion. The statesman and the judge, who distribute goods or assess damages justly, are in no danger of being unjustly treated; and the private citizen, who may be given too much or too

[1] I. 8–11.

little by the unjust act of the statesman or the judge, does not, so far as this goes, act at all, but is purely passive. The two points of view are confused. The only person who really chooses between the too much, the too little, and the right act is the man who chooses *either* to fulfil his contract *or* to depart from it to his own advantage *or* disadvantage. And there is no instinct towards the *third* course; if he adopts it he does not behave viciously. Thus the attempt to exhibit justice as a mean breaks down. Aristotle tries to treat injustice, i.e. graspingness, as both excess and defect because the unjust man takes too much of the useful and too little of the harmful for himself, and in assigning goods and evils to other people gives too much to one and too little to another. This is mere playing with words.[1]

Aristotle proceeds to draw two distinctions—(1) that between political and non-political justice. The former is that which exists between 'free and equal partners in a life aiming at self-sufficiency,' i.e. between citizens of a free state. But besides this there is something which may by analogy be called justice, which exists between master and servant, between parent and child. In these cases the subordinate party is in a sense a part of the superior party; they are not free persons standing over against each other, and justice in the full sense cannot exist between them. The relation of husband and wife, and the justice that can exist between them, are intermediate in kind; i.e. citizens have rights in the full sense, wives have them in a minor degree, and children and slaves least of all.[2] (2) The second distinction is that between natural and conventional justice. There is a class of rights and duties universally recognised, but on these are super-imposed rights and duties created by the laws of particular states. Aristotle opposes the common sophistic view that all justice is conventional. Yet even natural justice, according to him, admits of exceptions.[3]

Aristotle now passes to the inner side of justice. Justice is not merely the attainment of a mean or of a proportion, but presupposes a certain state of mind; it is the disposition to act in a certain way *by deliberate choice*. Men are not equally responsible for all acts which in point of fact fail to attain the mean. Four stages (apart from compulsory action) are recognised. (1) If you act in ignorance and inflict an injury

[1] 1132 b21–1134 a16.

[2] 1134 a17–b18.

[3] b18–1135 a15.

which could not reasonably be expected, this is accident. (2) If you act in ignorance and without malice and inflict an injury which might reasonably have been expected, this is mistake (our law would call it negligence). (3) If you act with knowledge but without deliberation, e.g. in anger, the act is an unjust act but does not imply that you are unjust. (4) If you act of deliberate choice, both the act and the doer are unjust.[1]

In drawing these distinctions, Aristotle is to some extent guided by the practice of Greek law-courts, but his intention is throughout moral, not legal. His theories have, however, had a great influence on jurisprudence. The distinction between common law and equity, for example, though it owes its precise form to a variety of historical facts, is to a large extent derived from Aristotle's recognition of equity as a kind of justice superior to legal justice, a 'correction of law where it is defective owing to its generality.'[2]

The Intellectual Virtues

Aristotle now passes from moral to intellectual virtue. Two reasons make it necessary to study the latter. (1) The virtuous man has been defined as acting in accordance with the 'right rule.'[3] The framing of this rule is an intellectual operation and we must consider its nature. (2) Happiness has been defined as 'activity of soul in accordance with virtue, or, if there be more than one virtue, in accordance with the best and most perfect.'[4] If we are to know what happiness is, we must consider the nature of the intellectual as well as of the moral virtues, and ask which virtue, out of all those in both classes, is the best.

The element in us which formulates rules—the rational element—is divided into (a) the scientific faculty whereby we contemplate objects that admit of no contingency; the rules it formulates, we may say, are of the type 'S is always P because S is always M and M is always P,' and (b) the calculative faculty (later[5] called the faculty of opinion), whereby

[1] 1135 ^{a}15–1136 ^{a}9.

[2] 1137 ^{a}31–1138 ^{a}3. Cf. *Rhet.* 1374 ^{a}26–^{b}22. The large place played by equity in the Greek administration of Justice is well brought out by Sir P. Vinogradoff, in *Outlines of Hist. Jur.* II. 63–69.

[3] 1103 ^{b}32, etc. [4] 1098 ^{a}16. [5] 1140 ^{b}26, 1144 ^{b}14.

we study things in which there is contingency; its rule (the practical syllogism) is of the type 'A should be done because A is a means to B and B is the end,' where the coming into being both of A and of B is contingent.[1] Now of the three predominant elements in the soul—sensation, reason, desire—sensation never determines action, as we can see from the fact that the lower animals have sensation but do not act. The other two elements do in different ways determine action, for moral virtue has been seen to be a disposition to choose, and choice to be deliberate desire, i.e. to involve desire for an end and reason (i.e. the 'calculative' species of reason) discovering the means to the end. The object of reason in its scientific form is truth; the object of reason in its calculative form is truth corresponding to right desire, i.e. truth about the means to the satisfaction of right desire. Bare thought moves nothing, but only thought thus directed to an end. Man, regarded as an originator of action, is a union of desire and reason. Truth being the aim of both the reasonable elements, the virtue of each must be that by which it reaches truth.[2]

Now there are five things by virtue of which we reach truth and whose very names imply their infallibility—science, art, practical wisdom, intuitive reason, theoretical wisdom.[3] (1) *Science* is (*a*) concerned with what is necessary and eternal, (*b*) communicable by teaching. Teaching always starts with the known, and proceeds by induction or by syllogism. But induction is not a scientific process; it supplies the first principles from which the syllogistic process, which is science, proceeds. Science is 'the disposition by virtue of which we demonstrate.'[4]

(2) In our manipulation of the contingent we may wish either to *do* something—to be active in a certain way, or to *make* something—to produce something distinct from the activity of producing it. *Art* is 'the disposition by which we *make* things by the aid of a true rule.' It is concerned with things which are neither necessary nor according to nature, i.e. neither with A's which are inevitably B nor with A's which tend to become B by virtue of some internal principle, but with A's which may be made to be B by the operation of an external agent. The work of art, which is the object set before itself by the activity of 'making,' is itself the means to some-

[1] 1138 b18–1139 a17.
[2] 1139 a17–b13.
[3] *ἐπιστήμη, τέχνη, φρόνησις, νοῦς, σοφία.*
[4] b14–36.

thing further, viz. the using of it, and ultimately to some form of action (as opposed to making) which is its own end; thus art is subordinate to practical wisdom.[1] Art includes useful as well as fine art, and Aristotle is as a rule thinking of the former. In the former case the use to be made of the work of art will be its use as the instrument of some intellectual or moral activity; in the latter its use might be supposed to be æsthetic contemplation, but there is no clear evidence that Aristotle thought of this as an end in itself.

(3) *Practical wisdom* is the power of good deliberation, not about how particular things are to be made, or particular states such as health and strength to be produced (these are objects of *art*), but about 'things good for oneself,' i.e. about how a whole state of being which will satisfy us is to be brought into existence. It is 'a true disposition towards action, by the aid of a rule, with regard to things good and bad for men.' Thus the practically wise man should know, to start with, what are the things 'good for man'; according to Aristotle's view he should know the conclusion which he himself arrives at in Book X., that the best thing for man is the life of contemplation, and he should deliberate as to the means by which this may be attained. It is this disposition, not the scientific disposition, that is apt to be perverted by pleasure and pain; vice, which takes pleasure and the avoidance of pain as the end of life, destroys the 'first principle,' i.e. the major premise of the practical syllogism, and prevents us from recognising the true objects towards which life should be directed.[2]

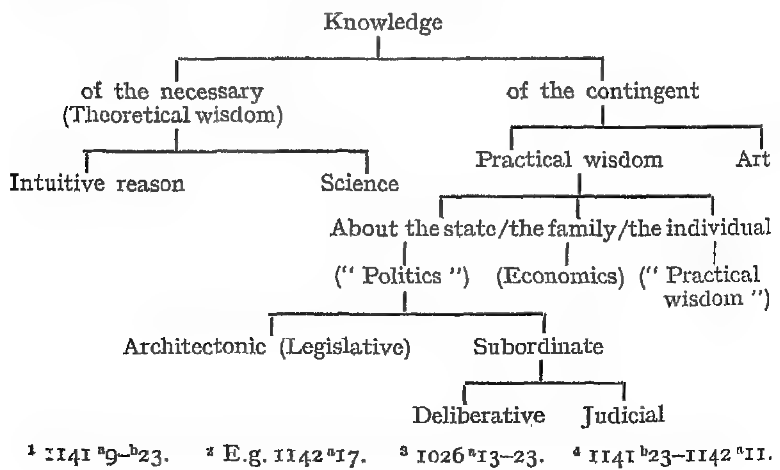
(4) *Intuitive reason* is that by which we grasp the ultimate premises from which science takes its start. It grasps the first principles by 'induction.' This is to be understood not as the 'perfect induction' of modern logicians, which does not lead to knowledge of a genuine universal, nor as their 'imperfect induction,' which reaches a merely probable conclusion, but as the process whereby after experience of a certain number of particular instances the mind grasps a universal truth which then and afterwards is seen to be self-evident. Induction in this sense is the activity of 'intuitive reason.'[3]

(5) *Theoretical wisdom* is the union of intuition and science, directed to the loftiest objects. It is as much superior to practical wisdom as its external objects, such as the physical elements, are superior to man, whose good is the object of

[1] 1140 ᵃ1–23, cf. 25–28. [2] ᵃ24–ᵇ30.
[3] ᵇ31–1141 ᵃ8, cf. 1139 ᵇ27–31; *An. Post.* 100 ᵇ3–17. Cf. pp. 38–41.

practical wisdom.[1] The mention of the elements shows that 'theoretical wisdom' is not here as in some passages[2] used of philosophy only, in opposition to science; it probably includes all the three divisions of 'wisdom' recognised in the *Metaphysics*[3]—metaphysics, mathematics, natural science. The contemplation of these subjects is, as we shall see from Book X., in Aristotle's view the ideal life for man.

'Practical wisdom' is co-extensive with political science, but its essence is not the same; i.e. it is one and the same wisdom that secures the good of the individual and that of the state, but in calling it practical wisdom we think of it as doing the one, and in calling it political science as doing the other. From the identification of the two, it follows that the writing of the *Ethics* (which is described as a work on politics) is not a work of science proper but of practical wisdom; Aristotle in fact carries up to a certain point the deliberative analysis which works back from happiness to the means to its proper production, and leaves it to individual agents to carry the process further in the light of their individual circumstances. 'Practical wisdom,' Aristotle tells us, has tended to be narrowed down to that part of it which is concerned with the good of the individual, under the belief that he will attain his own welfare best if he attends to it alone; but this tendency is wrong, for in an imperfect state the best individual life cannot be lived. And 'political science' has been narrowed down to its executive part, but this is equally mistaken.[4] The complete scheme of division is as follows:—



[1] 1141 a9–b23. [2] E.g. 1142 a17. [3] 1026 a13–23. [4] 1141 b23–1142 a11.

So far practical wisdom has been sharply distinguished from perception and from intuitive reason, but Aristotle now shows a tendency to bring them together.[1] Practical wisdom being concerned with particular actions, it is better to know the conclusion of the practical syllogism without the major premiss than the major premiss without the conclusion.[2] In other words, Aristotle recognises a secondary sort of practical wisdom which knows the right thing to do without arriving at it by a process of deliberative analysis—a wisdom about details which is found in those who have had a certain experience of life, even if they cannot formulate general principles.[3] Consequently, while practical wisdom is still opposed to intuitive reason, it is stated to be a kind of perception—not the kind by which we perceive the qualities apprehended by one sense and by one sense alone, nor even that by which we apprehend the common sensibles like shape, but a third kind.[4] The essential thing about perception is that it is apprehension of individual fact, and in this wide sense practical wisdom of the direct, unreasoned kind is a kind of perception ; good is for well-brought-up people a kind of common sensible, as shape is for all men. Again, though intuitive reason has been defined as the apprehension of general principles, the most essential thing about it is that it is direct, not ratiocinative apprehension. The ultimate minor terms of practical syllogism, as well as the ultimate major terms of demonstrative syllogism, are grasped not by ratiocination but by a perception which may equally well be called intuitive reason. Such premisses are further described as 'starting-points of the final cause,' since the universals are reached from the particulars.[5] There seems to be a confusion here between the minor premiss and the conclusion, no doubt due to the fact that they are both singular propositions having the same subject. It might fairly be said that, at the pre-reflective stage of which Aristotle is here speaking, it is the rightness of particular acts that is apprehended, and that from this we pass to formulating general principles of the form 'such and such a kind of action is good,' from which we later deduce the rightness of further particulars of the same type. This would be analogous to what happens in the purely intellectual sphere, where universals are reached by induction from particulars, and fresh particulars are then deduced from

[1] Cf. 1143 ᵃ25.
[2] 1141 ᵇ14–22.
[3] 1142 ᵃ11–20, 1143 ᵇ7–14.
[4] 1142 ᵃ23–30, cf. 1109 ᵇ23, 1126 ᵇ3.
[5] 1143 ᵃ35–ᵇ5.

the universals. But the knowledge of particular *minor premisses* cannot lead to the knowledge of general principles, for the minor premiss is a mere statement of fact, 'such and such an act has such a quality,' the predicate not being a moral predicate at all. There are traces of the same confusion (in Aristotle or in an interpolator) elsewhere.[1]

Aristotle now turns to the question of the utility of theoretical and practical wisdom. The former might seem to be useless since it does not study the means to happiness; the latter, since it studies the actions which a good man will do whether he has practical wisdom or not. If it be suggested that the object of practical wisdom is to enable us to *become* good, then it is of no use to those who are already good, and as for those who are not, why should they not consult a wise man, as one does a doctor, instead of trying to become wise themselves? The answer is that (1) apart from their effects, both forms of wisdom are good in themselves, simply because they are virtues. (2) Both kinds of wisdom produce happiness as being its formal cause, in distinction from its efficient cause; wisdom, or rather the exercise of it, is the *essence* of happiness. It is, of course, Aristotle's deliberate view that the end for man is the theoretical life; he here seems to say (less distinctly) that the life of practical wisdom is also a part of the end.[2] (3) Practical wisdom does produce an effect. Virtue, no doubt, makes us choose the right end to aim at, but practical wisdom makes us choose the right means. Practical wisdom, however, cannot exist independently of virtue. The power to attain one's end, be it good or bad, is not practical wisdom but cleverness. Let the right end be aimed at—and only virtue can ensure this—and cleverness becomes practical wisdom; let the wrong end be aimed at, and it becomes mere clever roguery.[3] And just as practical wisdom implies moral virtue, moral virtue in the proper sense implies practical wisdom. We may indeed start with a natural virtue, a disposition to behave justly or temperately, for instance, but if this be not accompanied by a knowledge of the effects which actions are likely to have, it never becomes moral virtue proper but remains futile and (as in the case of the conscientious persecutor) may become harmful. Thus the suggestion that virtue may be complete without practical wisdom, resting as it does on failure

[1] E.g. in 1141 ^{b}20 and perhaps in 1142 ^{a}23–30.
[2] 1144 ^{a}3–5.
[3] 1143 ^{b}18–1144 ^{b}1.

to see the interdependence of the two, is seen to be a mistaken one.

Aristotle is now able to state his relation to two vexed questions. (1) Virtue is not, as Socrates had said, simply wisdom, though it implies a certain kind of wisdom—the practical kind. The right rule is not its whole content, though without a right rule it could not exist. (2) Though the natural virtues can exist in isolation from one another, the moral virtues cannot, for any moral virtue implies practical wisdom and practical wisdom implies all the moral virtues. For, since practical wisdom implies that a man does not follow his instinctive tendencies such as they may happen to be—some good, others bad—but directs his whole life towards the chief good, it is incompatible with a one-sided moral development.

Finally, the relation of moral to intellectual wisdom is briefly stated. It is true that practical wisdom determines which studies are to be pursued in a state, but in doing so it is issuing commands not to theoretical wisdom but in its interests. It is inferior, not superior to theoretical wisdom.[1]

The question propounded at the beginning of Book VI.—'what is the right rule'—has not been answered in so many words, but Aristotle's answer is now clear. The right rule is a rule reached by the deliberative analysis of the practically wise man, and telling him that the end of human life is to be best attained by certain actions which are intermediate between extremes. Obedience to such a rule is moral virtue.

Continence and Incontinence

In Book VII. Aristotle is still occupied with the relations between intellect and desire, but from a different point of view. Three degrees of badness, he says, may be distinguished—incontinence (or weakness of will), vice, bestiality—and corresponding to them three degrees of goodness—continence, virtue, 'heroic and divine virtue.' Little is said of the extreme types, bestiality and superhuman virtue (or saintliness, as we might call it). The latter is rare; the former is chiefly found among barbarians, but is sometimes produced in civilised men by disease or mutilation; sometimes the name is applied to excess of ordinary vice.[2] Later[3] the bestial type is distin-

[1] 1145 ^{a}6–11, cf. 1094 ^{a}28–^{b}2, 1141 ^{a}20–22, 1143 ^{b}33–35.
[2] 1145 ^{a}15–^{b}20.
[3] 1148 ^{b}15–1149 ^{a}20.

guished definitely from the morbid type. Nothing more is said of superhuman virtue, and indeed Aristotle's doctrine as it is worked out leaves no room for anything higher than 'virtue.' Temperance (which is one of the virtues on the human level) is described [1] as involving the entire absence of bad desires, and there is no room for a superhuman virtue beyond this.

The main interest lies in the discussion of continence and incontinence, and certain states akin to them. The essence of incontinence is correctly held to be the acting from passion, knowing the badness of what one does; that of continence, that a man, knowing his appetites to be bad, resists them in obedience to 'the rule.' There are three main problems:—(1) Does the incontinent man act with knowledge, and if so in what sense? (2) What is the sphere of incontinence; is it pleasure and pain in general or some particular kind? (3) Is continence the same as hardiness? The second question is answered briefly at once by saying that the sphere of incontinence proper is the same as that which has been assigned to profligacy; the incontinent man differs, however, from the profligate in that the latter acts from choice, thinking that he ought always to pursue the pleasure of the moment, while the former does not think so but pursues it nevertheless.

(1) The first question is the most important one. The suggestion that we can act against opinion but not against knowledge is at once set aside; it will not help us to solve our difficulty, for opinion may be accompanied by as great a feeling of certainty as knowledge. Aristotle's own solution is offered in successive stages: (*a*) The familiar distinction between potentiality and actuality is drawn; it may be possible to act wrongly if you have the knowledge of the right at the back of your mind, though it would be impossible if you were actually knowing the right at the moment. This is a genuine contribution to the solution; its defect for Aristotle lies in the fact that it does not distinguish between the various items of knowledge which according to his theory are involved in knowing what you ought to do. To these he now proceeds. (*b*) You may be actually knowing the major premiss, e.g. 'dry food is good for man'; you may be actually knowing the minor premiss which makes the personal application, 'I am a man,' and perhaps further minor premises, such as 'food of a certain kind is dry.' But if you do not actually know the final minor

[1] 1151 ^{b}34–1152 ^{a}3.

'this food is of that kind,' the lack of this may make it possible for you to act incontinently. The weakness of this second solution is that it makes incontinence depend on ignorance of the minor premiss, which is a statement of non-moral fact, and ignorance of which, according to the doctrine of Book III.[1] would make the action *involuntary*. If the incontinent act is voluntary, as it clearly is, the ignorance involved must either be ignorance of the major premiss, or be due to something for which the agent is to blame, so that he acts (according to the distinction in Book III.[2]) in, but not through, ignorance. This is the alternative which Aristotle adopts. For (*c*) a refinement on the distinction between potentiality and actuality is now added. A kind of potential knowledge further removed from actuality is recognised—that of the man who is asleep, mad, or drunk. He is two stages removed from actual knowledge; he must first wake up, become sane, or get sober, and then he has still to pass from potential to actual knowledge. Now the condition of the incontinent man is in fact akin to this; passion changes the bodily state as sleep, madness, or drunkenness does, and sometimes actually maddens people. If the incontinent man in the moment of incontinent action sometimes utters sound moral maxims, that is no proof that he then actually knows them. (*d*) Aristotle now comes to closer grips with the facts. When both premisses of a practical syllogism are present (the reasoning process, which we have above seen to be really a sorites, is for simplicity treated as a syllogism), you *must* do the act to which the syllogism points; this is as certain as it is that if you grasp in their connexion the premisses of a theoretical syllogism you must draw the conclusion. Thus if you have premisses saying that 'everything that is sweet should be tasted, and this is sweet,' you must, if you are not prevented, taste the sweet object. This would, of course, not be incontinence; it would be profligacy. But there is another possible case. You may have a major which says 'nothing that is x should be tasted,' but the minor 'this is x' you may not know at all or know only in the remote sense in which, as we have seen, a drunken man may be said to know 'the verses of Empedocles'; and on the other hand you may have another major premiss 'everything that is sweet is pleasant,' and a minor 'this is sweet,' and you may have a desire for what is pleasant. Then you will take the sweet food. And your incontinent action will have been done under

[1] 1110 b31–1111 a24. [2] 1110 b24–27. Cf. p. 198.

the influence of a rule, and a rule theoretically quite consistent with the right rule. And just because incontinence is obedience to a rule it cannot exist in the lower animals.[1]

The upshot of this solution is to vindicate up to a certain point Socrates' view that one cannot act against knowledge. When you do the wrong thing you do not at the moment know it to be the wrong thing. Now it need not be doubted that the situation here described may exist. But at best this explanation will account for only one of the two forms of incontinence which Aristotle later distinguishes—for impetuosity as opposed to weakness. It says nothing of a moral struggle; the minor premiss of the moral syllogism (and with it the conclusion 'I ought not to do this') has never been present, or it has already been suppressed by appetite.[2] And the account which explains how the wrong act can be done in the absence of this knowledge cannot explain how the knowledge has come to be absent. But Aristotle elsewhere[3] shows himself alive to the existence of a moral struggle, a conflict between rational wish and appetite, in which the agent has actual knowledge of the wrongness of the particular act that he does. We must suppose that interest in his favourite distinctions of potential and actual, of major and minor premiss, has betrayed him into a formal theory which is inadequate to his own real view of the problem. What is missing in his formal theory is the recognition that incontinence is due not to failure of knowledge, but to weakness of will.

(2) Aristotle now turns to consider the *sphere* of incontinence. The things that give pleasure and excite desire are of three kinds: (*a*) the things which are in themselves worth choosing but admit of excess, such as victory, honour, wealth; (*b*) the things which are in themselves worthy of avoidance; (*c*) the things which are neutral in themselves, but necessary to the life of the body (nutrition and sexual activity).[4] Incontinence in the strict sense is concerned with the last of these kinds,

[1] 1146 b8–1147 b19.

[2] The precise form of the attempt in 1147 b13–17 to show that this explanation agrees with the Socratic view is a failure; it implies that the minor, not the major, premiss of the 'right rule' is known at the moment of incontinent action. And even so this sentence is inconsistent with itself and seems to need emendation. Prof. Stewart's *περιγίνεται* for *παρούσης γίνεται* gives the right sense.

[3] For example in 1102 b14–25, 1145 b21–1146 a4, 1150 b19–28, 1166 b6–10; *De An.* 433 a1–3, b5–8, 434 a12–15.

[4] 1147 b23–31, 1148 a22–26.

which is also the sphere of profligacy proper; in a wider sense it may be exhibited with reference to the first of the three, and is then less culpable, owing to the worthiness of the objects in themselves.[1] As for the second kind, the things not naturally or in themselves pleasant, pleasure may nevertheless be taken in them, and incontinence in a qualified sense be manifested in connexion with them, and this incontinence may be (i) bestial, where the whole nature of the agent is not far removed from that of the brutes (e.g. cannibalism), or (ii) morbid, where the craving is due to disease (e.g. paederasty). Such incontinence is subhuman, just as the corresponding type of profligacy has been described as subhuman and standing at the opposite extreme to superhuman virtue.[2] Yet a third kind of incontinence in a qualified sense is exhibited with regard to anger.[3] Thus not only temperance but several others (in principle, no doubt, all, but Aristotle does not carry his analysis so far) of the virtues in the 'list of virtues' have forms of weakness of will (as distinct from vice) answering to them.

(3) To the third question Aristotle replies that while the sphere of continence and incontinence is certain pleasures, hardiness is the power of holding out against the pain arising from the desire for such pleasures, and softness is yielding to such pain. And by an afterthought incontinence is itself divided into two kinds—weakness, which deliberates but cannot stand by the course determined upon, and impetuosity, which does not stay to deliberate. The impetuous man is better than the weak man because it takes a violent and sudden temptation to overcome him.[4] And similarly incontinence in general is less incurable than deliberate vice; it is intermittent, while profligacy is ingrained in the character, knows no repentance, and destroys the very spring of virtuous action, the true conception of the end of human life. Not merely does the profligate think that the pleasure of the moment should always be pursued—if that were all he might be convinced by reason—but this opinion is the expression of his very character.[5]

Pleasure

Aristotle naturally passes to a consideration of pleasure in general. Three views are put forward for discussion[6]:—

[1] 1147 ᵇ20–1148 ᵇ14.
[2] 1148 ᵇ15–1149 ᵃ20.
[3] 1149 ᵃ24–1150 ᵃ8.
[4] 1150 ᵃ9–ᵇ28.
[5] ᵇ29–1151 ᵃ28.
[6] 1152 ᵇ1–24.

(1) that no pleasure is good either in itself or *per accidens*—the view of Speusippus; (2) that some pleasures are good but most are bad—a view expressed in the *Philebus* of Plato;[1] (3) that even if all pleasures were good, pleasure could not be the supreme good—a view also expressed in the *Philebus*.[2]

The main interest here lies in Aristotle's discussion of the theory that pleasure is a process—in particular, the process of filling a void. His contentions are as follows:—(1) Even of so-called bad pleasures some may be good for a particular person or at a particular time, while others, which imply pain, are not really pleasures at all. (2) An activity, as well as a state, may be good; and the activities that restore us to our natural state are pleasant incidentally, but the activity involved is that of the part of our nature which has remained in its natural condition; there are activities like those of thought, which are pleasant without involving a deficiency or unnatural state at all. When we are in our natural state we take pleasure in what is pleasant in itself; when we are being restored to it, in things not pleasant in themselves. (3) Pleasures are not processes but activities and ends; and further only some are incidental to process, viz. those that accompany the perfecting of our nature; the others are incidental to action. Pleasure is not 'felt process,' but unimpeded activity of a natural state. (4) To infer that some pleasures are bad because they promote disease is like saying that some healthy things are bad because they are bad for money-making; even thinking is sometimes bad for health. It is only alien pleasures that are a hindrance to anything; the pleasures that flow from thinking aid thinking. (5) The arguments drawn from the facts that the temperate man avoids pleasure, that the wise man pursues not pleasure but freedom from pain, that children and the brutes pursue pleasure, all rest on a failure to distinguish between the bodily pleasure that involves appetite and pain, and the pleasure that is good without qualification.[3]

That pleasure is a good follows from the facts that pain is (as all admit) an evil and that pleasure is opposed to pain just in that respect in which pain is an evil. Even if most pleasures were bad, happiness must be the unimpeded exercise either of all our faculties or of some of them, and this is pleasure, so that—so far as this objection goes—pleasure might be the *summum bonum*. The general view is right in regarding pleasure as at least an ingredient in happiness, for, since happiness is perfect

[1] 48 a ff. [2] 53 c, 66 e–*fin*. [3] 1152 b25–1153 a35.

activity, it must be unimpeded; it is nonsense to say that the good man is happy on the rack. The fact that all animals pursue pleasure is a sign of its being in some sense the *summum bonum*; perhaps at bottom all are pursuing not the pleasure they think they are pursuing, but all of them the same pleasure; for all have by nature something of the divine.[1]

Even bodily pleasures, which from their familiarity are often identified with pleasure as a whole, must be good in some sense, since the opposite pains are admittedly bad. Are they good merely in the sense of not being bad, or are they positively good up to a certain pitch of intensity? Such pleasures are thought preferable to others (1) because they expel pain better than less violent pleasures do (on the other hand the prejudice against pleasure is due to the fact that some of them presuppose a bad and others an impaired nature). (2) Apart from special pains, pain is, as some physiologists say, the normal state of the animal creation; such pleasures because of their violence assuage this pain. Young and excitable persons, at all events, are constantly restless and need some such assuagement.

But really things which thus assuage a want or cure an imperfection are only indirectly pleasant; it is the activity of what remains healthy in us that affords the cure and gives the pleasure. The things that are naturally pleasant are those that stimulate the activity of a given nature. We might illustrate Aristotle's meaning by contrasting the enjoyment of music as a relief from pain or anxiety with the 'proper' enjoyment of music by a musical person. If our nature were simple and free from opposites we could find enjoyment in a single unchanging pleasure, and such is the experience of God, whose activity involves no process but is an 'activity of immobility,' an activity that reaches its end at every moment of itself.[2]

In Book X. pleasure is treated from a different point of view. Aristotle has so far been defending it against excessive attack and vindicating for it a place in happiness, a place which at one point he overstates so far as to suggest (he never says so quite unequivocally) that it is the chief good. He now proceeds to give a more balanced statement, defining his view not only against that of the extreme opponents of pleasure, but also against that of Eudoxus, who regarded it as the good. This discussion and the former one to a large extent repeat and to a small extent contradict one another, but neither is the

[1] 1153 ᵇ1–1154 ᵃ7. [2] 1154 ᵃ8–ᵇ31.

repetition so close nor the contradiction so violent as to make it difficult to suppose that both are independent essays by Aristotle himself. Where there is contradiction, the preference must be given to Book X., for here Aristotle not only criticises the views of others [1] but states his own position positively.[2] His view is as follows :—Pleasure, like seeing, is complete at each moment of its existence ; it does not by lasting longer become any more perfect in quality. Therefore it cannot be a movement, i.e. a process or transition ; for all movement takes time, aims at a certain end, and is complete only when it has attained its end, i.e. either in the time which it occupies, taken as a whole, or in the moment of attainment. Each part of a movement is incomplete and is different in kind from the others and from the whole. The clamping together of the drums is different from the fluting of the column, and this from the building of the temple as a whole ; and while the building of the temple is a complete achievement, the making of the foundation or of the triglyph is incomplete, being but a contribution towards a larger whole. Even in a comparatively homogeneous movement like that of walking, any two stages are from different points to different points and thus are different movements. Pleasure, on the other hand, is in each moment perfect in kind, as is evident also from the fact that being pleased does not take time and that we cannot be said to be pleased quickly or slowly, though we may become pleased quickly or slowly. The effect of this passage is to confirm the point already made in Book VII., that the objections to pleasure grounded on the supposition that it is a transition break down. If it were a transition, a filling, a completing, it would be inferior to that in which it culminates, and while we were pleased we should be restless till we reached the state to which pleasure leads. But it is in fact something complete in itself and satisfactory in every moment of itself, just like the activity of perception or of thought.

From the nature of pleasure Aristotle passes to its conditions. When one of our senses is in a healthy state and is engaged on an object which is good of its kind (e.g. a distinctly visible object), the activity of that sense is necessarily most pleasant, and the same is true of the activity of thought. And the pleasure completes the activity. Aristotle elsewhere makes the point that pleasure intensifies activity, i.e. makes the activity of the next moment more intense than it would otherwise have

[1] 1172 a19–1174 a12. [2] 1174 a13–1176 a29.

been.[1] But here his meaning seems to be that the pleasure in some sense perfects the very activity which it accompanies. It is not, however, a condition precedent of good activity; the agent (e.g. the sensible object) and the patient (e.g. the sense, or its organ) are the precedent conditions. It is like the bloom of youth, something that supervenes on the activity produced under these conditions and, being desirable itself, makes it more desirable than it would otherwise be—very much as, according to Kant, the addition of happiness turns the *bonum supremum* into the *bonum consummatum*.

Pleasure being thus closely bound up with activity, one might suppose that men desire pleasure because they desire life and because pleasure perfects the activities which make up life. Aristotle defers the question whether life is desired for the sake of pleasure or pleasure for the sake of life. Pleasure does not arise without activity, and activity is incomplete without pleasure; it matters not greatly whether we say that we desire activity *qua* pleasant or pleasure *qua* accompanying activity.[2]

Since activities differ in kind, the pleasures that complete them also differ in kind, for each activity can be completed only by its proper pleasure. We do things better when we take pleasure in them; the less we enjoy what we are doing the more we tend to do other things, 'as people eat sweets the more in the theatre, the worse the performers are.' We do things worse when alien pleasures interfere; they have much the same effect as 'proper pains,' pains arising out of the activity in hand. There is a great difference, then, between one pleasure and another. And as activities differ in goodness or desirability, their proper pleasures will differ accordingly. Each race of animals has its own pleasure, but different men take pleasure in different things. Which pleasures, then, are the true human pleasures? Those in which the practically wise man delights; or, to put it more objectively, those which complete the function or functions proper to man.[3]

In this passage Aristotle distinguishes pleasure from activity; he recognises a difference between it and genuine activities like those of perception or thought. It is not something that we do but a sort of colouring that attaches to the doing of things. In this respect the present passage is a notable advance on Book VII. The distinction of the kinds of pleasure is more

[1] 1175 a30–36, 1177 b21. [2] 1174 a13–1175 a21. [3] 1175 a21–1176 a29.

mature than anything found there. But in the latter part of the passage there is a tendency to confuse the legitimate question, which pleasures are valuable, with the illegitimate one, which pleasures are really pleasures. All pleasures are really pleasures; it is of their goodness, not of their being pleasures, that the good man is a judge.

Friendship

It is somewhat surprising to find two whole books[1] of the *Ethics* devoted to the subject of friendship. But it must be remembered that the Greek word has a wider meaning than the English; it can stand for any mutual attraction between two human beings. The discussion is a valuable corrective to an impression which the rest of the *Ethics* tends to make. For the most part Aristotle's moral system is decidedly self-centred. It is at his own *εὐδαιμονία*, we are told, that man aims and should aim. In the account of justice there is an implicit recognition of the rights of others. But in the whole of the *Ethics* outside the books on friendship very little is said to suggest that men can and should take a warm personal interest in other people; altruism is almost completely absent. Traces of an egoistic view are present even in the account of friendship, as they should be, for friendship is not mere benevolence but demands a return. But justice is done to the altruistic element; loving is said to be more essential to friendship than being loved[2]; a man wishes well to his friend for his friend's sake, not as a means to his own happiness.[3] The various forms of friendship mentioned by Aristotle are all illustrations of the essentially social nature of man. On the lowest plane he needs 'friendships of utility,' since he is not economically self-sufficing. On a higher plane, he forms 'friendships of pleasure'; he takes a natural delight in the society of his fellows. On a higher still, he forms 'friendships of goodness' in which friend helps friend to live the best life.[4]

The reasons Aristotle gives for treating of friendship are two in number. It is a virtue or (more precisely) implies virtue, and it is most necessary to life.[5] The latter reason is that which is more emphasised. In Book I. friends had been included as an important part of the equipment necessary for happiness. Here the necessity of friends, from more than

[1] VIII., IX. [2] 1159 ᵃ27. [3] 1155 ᵇ31.
[4] 1155 ᵇ17–1156 ᵃ5, 1169 ᵇ3–1170 ᵇ19. [5] 1155 ᵃ3 5.

one point of view, is stated. How can we make prosperity secure without their aid; and how can we enjoy it without them to share it with? When young we need their advice, when old their care; when we are in our prime they give us the opportunity of noble actions and aid us in effective thought.

The most interesting part of the discussion is that in which Aristotle propounds the view that friendship is based on the love of the good man for himself. Elsewhere he warns us against supposing that 'self-relation' can be an accurate phrase. 'By a metaphor we may say that there is justice—not between a man and himself but between two parts of him.'[1] Aristotle is in effect there criticising Plato's view of justice as essentially a relation within the self. But he puts forward a not dissimilar view about friendship—deeming himself justified, no doubt, by the more intimate nature of the relation. Four characteristics of friendship (which may be reduced to two—disinterestedness and sympathy) are said to characterise the good man's relation to himself. The good man wishes and does the best for the intellectual element in him which is most truly himself; he has most harmony with himself at any given moment, and most constancy from moment to moment. It is because these relations exist within the good man and because his friend is to him another self, that friendship is held to possess these characteristics.[2] Aristotle's theory here is an attempt to break down the antithesis between egoism and altruism by showing that the egoism of a good man has just the same characteristics as altruism. But the attempt to find within the self static elements of which one can be interested in and sympathise with the other is a failure; these relations involve two distinct selves. Elsewhere Aristotle seems to follow a better way, by suggesting that the self is not a static thing but capable of indefinite extension. When he speaks of men's treating their friends as 'other selves'[3] or as 'part of themselves,'[4] he is pointing to the fact that a man may so extend his interests that the welfare of another may be as direct an object of interest to him as his own welfare. A mother, for instance (a case to which Aristotle often recurs),[5] feels pain from her child's pain as much as from the hurt of her own body. Her altruism may thus be called egoism. But

[1] 113^{b}8 ·5–7.
[2] 1166 ^{a}1–^{b}29.
[3] 1161 ^{b}28, 1166 ^{a}32, 1169 ^{b}6, 1170 ^{b}6.
[4] 1161 ^{b}18.
[5] 1159 ^{a}28, 1161 ^{b}27, 1166 ^{a}5, 9.

to say this is not to condemn it. There is a good self-love as well as a bad; the question is what sort of a self it is that you love. It may be one which takes its delight in money, honour, and bodily pleasure, the 'goods that are fought about,' which are such that the more one man has of them the less another must have. Or it may be one which finds its interest in the welfare of friends and fellow-citizens. Such a man will spend his money that his friends may have more, but even then he gets the better of the bargain; they get only money, but he gets 'the noble,' the satisfaction of doing what is right. And even if he dies for others, he gains more than he loses.[1]

In this section of the *Ethics* Aristotle's intellectualism becomes more and more apparent. Reason is represented as the most authoritative element in man, that which is most truly himself,[2] that which the good man in acts of self-sacrifice is gratifying.[3] Thus the way is prepared for the section of the *Ethics* in which Aristotle sets himself to say what constitutes happiness.[4]

The Ideal Life

We have seen from Book I. that happiness must be not a state or disposition but an activity, and an activity desirable in itself. Now the things that are desired for their own sake are (1) activities in accordance with virtue, and (2) amusements. Amusement cannot be the end of life, for, though it is desired for itself, it is not *valuable* for its own sake, but as a relaxation which fits us for serious activity. Happiness must be activity in accordance with virtue.[5] Now from Book VI. we know that intellectual and moral virtue are distinct from one another. We have learnt that both theoretical and practical wisdom are good in themselves apart from any good that they produce, since they are virtues of distinct parts of the soul; we have been told definitely that theoretical wisdom, and less definitely that practical wisdom, is not, or not only, a means to happiness, but in its exercise constitutes happiness. But we have also learnt that theoretical wisdom is superior to practical and that at any rate part of the value of the latter is that it helps to produce the former. It is clear that contemplation is for Aristotle the main ingredient in happiness; whether moral action is another ingredient in it or only a means to its produc-

[1] 1168 a28–1169 b2. [2] 1166 a17. [3] 1168 b30.
[4] 1176 a30–1179 a32. [5] 1176 a30–1177 a11.

tion is not so evident. The doubt is not entirely removed by Book X. Happiness, we are told, must be activity in accordance with the virtue of the best part of us, which is reason. The activity which is happiness is theoretical. This is the best activity of which we are capable, since it is the exercise of the best in us on the best of all objects, those which are eternal and unchanging; it is what we can do most continuously; it brings pleasure of wonderful purity and stability; it is least dependent on other men, while moral virtue requires others as the objects of its activity; it alone seems to be loved for itself, while practical activities—notably the greatest of them, the deeds of the statesman and the soldier—aim at goods beyond themselves; it is the life we must ascribe to the gods, since the ascription of moral life to them would be absurd.[1] But the life of contemplation is too high for us; we cannot live it *qua* men, beings compounded of body, irrational soul, and reason, but only in virtue of the divine element in us. We must not, however, follow those who say that being men we should mind human things; we must, as far as may be, 'lay hold on eternal life' by living the life of that which, however small a part of us it be, is the best thing in us, and the most truly our self. He who thus lives is the happiest man.[2]

He is not, however, the only happy man. The life of moral virtue and practical wisdom, concerned as it is with feelings springing from our bodily nature, is the life of the whole composite being which man is, and gives a happiness which may be called 'human happiness.'[3] The part assigned to the moral life then by Aristotle seems to be twofold. (1) It constitutes a secondary form of happiness, one which we are driven to fall back upon by the fact that we are not all reason and cannot live always on the level of the contemplative life. And (2) it helps to bring into being the higher kind. Aristotle says very little about how it does this. The practical wisdom of the statesman provides by legislation for the pursuit of scientific and philosophical studies. And we must suppose that in the individual life also Aristotle thought of moral action as providing for the existence of intellectual activity by keeping in subjection the passions. But though his formal theory thus makes the moral life subsidiary to the intellectual, this relation is not worked out in detail. When Aristotle is engaged in studying the moral activities he treats them as good in them-

[1] 1178 b8–22.

[2] 1177 a12–1178 a8.

[3] 1178 a9–1179 a32.

selves, and the moral agent as finding his motive in nothing beyond the act, but in its own nobility. In effect he assigns a higher value to the moral life than his formal theory warrants.

If it be asked what Aristotle means, in particular, by the contemplative life, the answer is that he means the contemplation of truth in two and perhaps in three departments, mathematics, metaphysics, and perhaps also natural philosophy.[1] The happy life is not one of search for truth, but one of contemplation of truth already attained.[2] It has been suggested that it is, for Aristotle, a life of æsthetic and religious as well as of scientific contemplation. There is, however, nothing to show that æsthetic contemplation formed for Aristotle any part of the ideal life; in the *Poetics*, where he considers one particular form of æsthetic experience, that of tragedy, he makes its value lie in its medicinal effect. On the other hand, since the highest branch of contemplation is called by the name of theology,[3] it is reasonable to suppose that this part of the contemplative life would have the character of worship proper to the contemplation of the divine nature. This aspect of the ideal life is much emphasised in the *Eudemian Ethics*, where the ideal is defined as 'the worship and contemplation of God.'[4]

[1] All three are branches of theoretical wisdom (*Met.* 1005 b1, 1026 a18), but physics is the study of contingent events (1140 a14–16), while theoretical wisdom is of the non-contingent (1139 b20, 1140 b31, 1141 a3, 1141 a19). The contradiction may be removed by recognising that physics is the study of the non-contingent element in contingent events: the variable element is incalculable and cannot be studied at all.

[2] 1177 a 26. [3] *Met.* 1026 a19. [4] *E.E.* 1249 b20.

CHAPTER VIII

POLITICS

THE structure of the *Politics* presents a difficult and much-discussed problem. Most modern scholars hold (1) that Books VII., VIII. should come before Books IV.–VI., and some hold (2) that Book VI. should come before Book V. (1) The last chapter of Book III. announces a transition to the discussion of the best constitution, which is actually undertaken in Book VII.; and the first sentence of Book VII. exists in a mutilated form as the last sentence of Book III., as token of the intention either of Aristotle or of some early editor to connect the two books. Further, Book IV. refers back to the discussion of the ideal constitution,[1] while Books VII., VIII. nowhere distinctly refer back to Books IV.–VI.[2] On the other hand, after the classification of constitutions in Book III. and the discussion of monarchy (and incidentally of aristocracy) in the latter part of that book, we should expect Aristotle to go on to discuss the other types, as he does in Books IV.–VI.; Books VII., VIII., which are mainly occupied with questions of education rather than of constitution, would seriously interrupt the continuity of the thought. (2) Book VI. continues the line of thought of the end of Book IV., on the proper organisation of the various forms of government, and Book V. (on revolution) interrupts this. On the other hand, Book VI. several times refers back to Book V.,[3] and Books IV., V. fulfil in the proper order the programme laid down at the beginning of Book IV.;[4] Book VI. seems to be an afterthought in which Aristotle further develops the subjects of Book IV.

But it is probably a mistake to suppose that there is an

[1] 1289 a31. The other passages cited by Zeller, 1289 b15, 1290 a2, b39, 1293 b2, are not conclusive.

[2] 1325 b34 may refer either to these books or to Bk. II.

[3] 1316 b34, 1317 a37, 1319 b4, 37.

[4] 1289 b12–26.

original or a proper order of the books of the *Politics*. A study of the beginnings of the various books [1] shows that the work is a conflation of five separate treatises :—(1) on the household —a proper preliminary to the study of the state since the state springs from the household (Book I.) ; (2) on proposed ideal commonwealths and the most esteemed existing constitutions (Book II.) ; (3) on the state, the citizen, and the classification of constitutions (Book III.) ; (4) on the inferior constitutions (Books IV.–VI.) ; (5) on the ideal state (Books VII., VIII.) The last two sections are both unfinished. On the whole, the traditional order (which goes back at least to the first century A.D.) gives the most consecutive line of thought, except that Book V. is better read after Book VI.

Books VII. and VIII. differ from the first three by being more dogmatic in their tone, and the more careful style suggests that they are at any rate partly based on published works.[2] Books IV.–VI. differ from the rest of the *Politics* in adopting a more practical and less ideal tone ; in particular Book V., in the attention it pays to the means of preserving even the most corrupt forms of government, is the parent of Machiavelli's *Prince*. They differ too from the rest of the *Politics* in the mass of historical detail they contain. Aristotle, we may remind ourselves, had compiled (or caused to be compiled) an account of 158 Greek constitutions. We feel here even more than elsewhere how completely he is master of the whole lore of the city-state, and how firmly his feet are planted on history.

His method is even in the other books to a large extent inductive. But at the same time he often bases his political views on more comprehensive and fundamental theories, metaphysical or ethical. He assumes the priority (in a definite sense) of whole to part ; the identity of the nature of a thing with the end towards which it is moving ; the superiority of soul to body, of reason to desire ; the importance of limit, of moderation ; the difference between organic parts and subsidiary conditions. His political views form part of a large and well-knit system of thought. But sometimes the use made of general principles is somewhat arbitrary, and we feel that they

[1] Confirmed by a small but significant point, the absence of connecting particles at the beginning of certain books.

[2] Probably on the *Protrepticus*. The affinity of Books II., III., VII., VIII. to the standpoint of this work and of the *Eudemian Ethics* has been well used by Jaeger (*Arist.* 271–307) as showing them to be the earliest part of the *Politics*.

are put forward as reasons for holding beliefs which Aristotle would have held in any case.

The *Politics* opens with a section[1] the object of which seems to be (1) to vindicate the state against the sophistic view of it as existing by convention and having no real claim on the allegiance of its members, and (2) to throw light on its nature by distinguishing it from other communities. Aristotle plunges *in medias res* by asserting that since every community is formed for the sake of some good, the state, which is the supreme and all-embracing community, must aim at the supreme good. The teleological point of view which he adopts is characteristic of his whole system. The meaning and nature of everything in the world, whether living creature, instrument, or community, is to be looked for in the end of its being. In the case of an instrument this is an end desired by its user, and the form of the instrument is in accordance with this end imposed on its matter from without. In the case of a living creature or of a community the end is immanent to the thing itself—for the plant the life of growth and reproduction, for the animal the life of sensation and appetite which is superimposed on the vegetative life, for man and for the human community the life of reason and moral action superimposed on the two others. The explanation of things is to be found not in what they have developed from but in what they are developing into; their nature is seen not in their origin but in their destiny.

The word which we render 'state' means, no less, 'city.' Though Aristotle stood at the end of the golden period of Greek city life and was in close touch with Philip and Alexander, it was in the city and not in the empire that he saw not only the highest form of political life up to date, but the highest of which it was capable. Any larger aggregate was for him a mere tribe or ill-knit congeries of people.. Neither an empire imposing its civilisation on more backward peoples nor a nation-state came within the scope of his vision. Apart from the Macedonian empire, there had been interesting political developments in Greece (such as the empires of Athens and of Sparta and the various leagues of equal states) of which he takes no account. He has only one allusion to the good consequences that would have followed on a union of the Greek states.[2] For insight into Greek political life as it was, he has no equal; but imagination was his in a lesser degree. He assumes with little enquiry that human life can be lived most fully in a small community where

[1] I. 1, 2. [2] 1327 ᵇ32.

every citizen knows every other and takes his share not only in choosing his rulers but in 'ruling and being ruled' in turn. In the course of history city-states have proved unable to maintain themselves against larger and more powerful aggregates. Their inferiority has not thereby been proved; there is much to be said for Aristotle's view. But one would have liked to see a reasoned defence of it.

It is clear that the state belongs to the genus 'community'; its differentia is not so clear. Aristotle undertakes to show that it is not, as had been supposed, its larger size. His method of discovering the differentia of the state is to analyse it into its parts, and to study it in its beginnings. There are two primary instincts which lead human beings to associate themselves together;[1] the reproductive instinct which brings together man and woman, and the instinct of self-preservation which brings together master and slave—provident mind and sturdy body—for mutual aid. Thus we get a minimum society of three persons—the family, which is 'the association established by nature for the supply of everyday wants.' The next stage is the village, which is a union of several families 'for the supply of something more than everyday wants.' Aristotle does not specify these further wants, but we may conjecture that he had in mind that the village made possible a greater division of labour and therefore the satisfaction of more varied needs, as well as more complete protection against man and beast. The village, he adds, is formed most naturally by the union of families of common descent. The third stage is the union of several villages into 'a complete community large enough to be nearly or quite self-sufficing, coming into being for the sake of life but existing for the sake of good life.' This is the differentia of the state. It came into being for the same reason as the village—for the sake of life. But it is found to satisfy a further desire—the desire for good life. Good life includes for Aristotle two things, moral and intellectual activity. The state offers a more adequate field than its predecessors to moral activity, a more varied set of relations in which the virtues may be exercised. And it gives more scope for intellectual activity; a completer division of intellectual labour is possible, and each mind is more fully stimulated by the impact of mind on mind. 'If the earlier forms of society are natural, so is the state, for it is the end of them and the nature of a thing is its end. For what each thing is when fully developed, we call its nature. . . .

[1] I. 2.

Hence it is evident that the state is a creation of nature, and that man is by nature a political animal. . . . He who is unable to live in society, or who has no need because he is sufficient for himself, must be either a beast or a god.' Aristotle did good service to political thought by insisting that the state does not exist merely by convention but is rooted in human nature; that the natural is to be found, in its truest sense, not in the origins of human life but in the goal towards which it moves; that civilised life is not a declension from the life of a hypothetical noble savage; that the state is not an artificial restriction of liberty but a means of gaining it. He is here implicitly attacking two views which had found favour in Greece :—(1) the view of some of the sophists, such as Lycophron [1] or Thrasymachus, that law and the state are mere products of convention, interferences with the liberty of the individual which are either forced on him by his masters or adopted by him merely as a safeguard against injury; and (2) the view of the Cynics, that the wise man is sufficient to himself and should be a citizen of no country but only of the world—a view which was encouraged by the disillusionment that fell upon Greece with the defeat of Chaeronea.

In describing the state as natural, Aristotle does not mean to make it independent of human volition. It is by human volition that it was formed and is maintained, and by human volition it can be moulded 'nearer to the heart's desire.' But he asserts that it is natural in the sense that it is rooted in the nature of things and not in man's caprice.

In his zeal for the state he does not like Plato depreciate the family. The state is for him a community of communities. The family has its own function in the scheme of life. We miss, however, a recognition of the other communities of which man is a member—his church, his profession, the voluntary societies to which he belongs. It has often been remarked that where Aristotle says man is a political animal we might prefer to say he is a social animal, needing his fellows in a variety of capacities and not merely as fellow-citizens. The distinction between the state and society was, indeed, not clear to any Greek thinker. Religion was so much a national and for the most part so much an external and conventional thing, so much a matter of cultus, so little a matter of deep conviction and emotion, that the notion of a cleavage between church and state such that there might be many churches in one state, or one church with

[1] 1280 b10

members in many states, did not so much as occur to the Greeks, and one of the influences which have made us sit relatively loosely to the state was therefore in their case absent. Thus the moral education which many would think the natural business of the church was by Aristotle unhesitatingly assigned to the state. Again, as regards other voluntary societies within the state, so intimate was the entrance of the Greek state into all departments of life that such societies also were viewed by them as functions of the state.

But if we should wish to supplement Aristotle by saying that man is a social animal, it remains true that he is a political animal. The political union is no less natural than these others which are more evidently voluntary; and there is none of them except the church which can compare with it in importance and value. A powerful claim may no doubt be made for economic organisations; but these have for the most part held the allegiance of men less firmly than church and country, and it will be unfortunate for mankind if societies which aim at 'mere life' ever take precedence over those which appeal to something higher in man.

Slavery

Having pointed out the derivation of the state from the household, Aristotle proceeds to consider the 'parts of household management.' The only two which are discussed at length are the relation of master and slave and the acquisition of wealth. With regard to slavery[1] he finds himself faced by two views, one which holds that the rule over slaves is identical in kind with political rule, being an instance of the normal rule of superiors over inferiors, and another which holds that nature recognises no distinction between master and slave, that slavery rests on an unnatural convention and is therefore unjust. He devotes himself first[2] to pointing out the essence of a slave. In essence he is 'an instrument for the conduct of life,' in other words 'a living possession.' If the shuttle could weave without a hand to guide it, Aristotle adds in unconscious anticipation of the age of machinery, masters would not need slaves. But the slave is an instrument not of production but of action—not for making some particular article but to aid in the general conduct of life. I.e., it is the domestic rather than the agricultural or industrial slave that is in question.

[1] I. 3–7. [2] I. 4.

The next question [1] is whether there are any persons intended by nature to play this part. In answer Aristotle points out that the antithesis of superior and inferior is found everywhere in nature—between soul and body, between intellect and appetite, between man and the animals, between male and female, and that where such a difference between two things exists it is to the advantage of *both* that one should rule the other. Nature tends to produce such a distinction between men—to make some strong to work and others fit for political life. Thus some men are by nature free, and others slaves.

Yet there is something to be said on the other side.[2] Much existing slavery is founded merely on conquest, and such slavery is naturally detested. Each view goes too far and trespasses on the ground of the other. Power tends to imply superiority of some kind, and therefore might is held by some to constitute right; on the other hand there is a tendency to hold that only a relation of mutual goodwill can be just. Neither view can maintain itself against the intermediate view that the superior *in excellence* ought to rule. Nor will it do to say that at all events one kind of justice is founded on custom, and that therefore slavery in accordance with the custom of war is justified. Those who hold this would themselves hesitate to justify the enslavement of people of high birth, or of Hellenes. At bottom they too wish to base slavery on inferiority of nature. Where this exists, slavery is in the interest of both master and slave.

It has often been pointed out that the high development of culture in Athens owed its existence to a leisure for political and intellectual activity which was possible for Athenian citizens only because the drudgery of life was devolved upon a slave class. It is not surprising that Aristotle should regard as belonging to the nature of things an arrangement which was so fundamental to Greek life. It is also to be noted that Greek slavery was for the most part free from the abuses which disgraced Roman slavery and have often disgraced the slave system in modern times. There are certain qualifications of Aristotle's approval of slavery which must be noted. (1) The distinction between the natural freeman and the natural slave is, he admits, not always so clear as might be wished. Nor is the child of a natural slave always a natural slave.[3] (2) Slavery by mere right of conquest in war is not to be approved. Superior power does not always mean superior excellence. What if the cause

[1] I. 5. [2] I. 6. [3] 1254 b32–39, 1255 b1–4.

of the war be unjust? Greek should in any case not enslave Greek.[1] This element in Aristotle's view may well have struck contemporaries as the most important part of it. Where to us he seems reactionary, he may have seemed revolutionary to them. (3) The interests of master and slave are the same. The master therefore should not abuse his authority. He should be the friend of his slave. He should not merely command, but reason with him.[2] (4) All slaves should be given the hope of emancipation.[3]

What cannot be commended in Aristotle's view, however, is his cutting of the human race in two with a hatchet. There is a continuous gradation of mankind in respect of both moral and intellectual qualities. This gradation leads and probably always will lead to a system of subordination. But in such a system no member should be regarded as simply a 'living tool.' Aristotle's treatment of the question contains implicitly the refutation of his theory. He admits that the slave is not a mere body but has that subordinate kind of reason which enables him not merely to obey a command but to follow an argument. Again, he says that though the slave as a slave cannot be the friend of his master, as a man he can.[4] But his nature cannot thus be divided. His being a man is incompatible with his being a mere living instrument.

Acquisition of Wealth

The next section of the *Politics*,[5] which forms Aristotle's chief contribution to economics,[6] is linked with the main subject of Book I. by the question how the acquisition of wealth is related to household management. Aristotle answers the question by distinguishing two modes of acquisition of wealth. There is the natural mode, which consists in the amassing of those products of nature which are needed for the purposes of life. He distinguishes here three main kinds—grazing, hunting (subdivided into piracy and brigandage, fishing, and hunting proper), and husbandry. To this mode a natural limit is fixed by the needs of man for food and clothing. This mode is a part of household management and of statesmanship,[7] or more properly a precondition of them;[8] the task of the household

[1] I. 6. [2] 1255 b9–14, 1260 b5–7, 1278 b33. [3] 1330 a32.
[4] *E.N.* 1161 b5. [5] I. 8–11. [6] But cf. p. 212 f.
[7] 1256 b26. [8] 1256 a11, 1258 a19–37.

manager and the statesman is to use what has thus been amassed.

Intermediate between this and the second mode of acquiring wealth is barter.[1] Aristotle draws here the afterwards famous distinction between the value of things in use and their value in exchange. You may either wear a shoe or barter it; in either case you use it 'in itself,' but the former is its 'proper use,' the use which can be made of it and of nothing else. Barter up to a certain point is natural, viz. so far as it is the acquiring of what is really needed for the purposes of life. The second and unnatural way of acquiring wealth is reached when goods begin to be exchanged not for goods but for money. The intrinsic characteristics of money which Aristotle points out are (1) that it is more portable than goods, and (2) that it has a utility of its own apart from its convenience for exchange. This is true of metallic money, and it is not surprising that he did not foresee the use of paper money. What is more surprising is that he regards the whole acquisition of wealth by trade other than barter as unnatural and even wrong. His objection rests on a moral basis. He condemns the unlimited pursuit of wealth beyond what is needed for the purposes of life. But he does not notice that the pursuit of wealth for its own sake may arise even at his earliest stage, where goods are accumulated and exchange has not begun, and that in barter no less than in the exchange of goods for money profiteering is possible. Nor does he see that the commercial class, which he condemns, renders a useful public service and makes its profits only because it does so. His view is too much a reflexion of the ordinary Greek prejudice against trade as an illiberal occupation.

He further thinks that of the unnatural acquisition of wealth the worst kind is usury, on the ground that money, itself an unnatural invention, is here used not for its original purpose, exchange, but for a yet more unnatural one.[2] Here again a justifiable moral prejudice against iniquitous usury blinds him to the economic services rendered by lenders of capital. No doubt he is thinking not of the lending which makes industry possible but of that which takes advantage of the poor man who is driven by the needs of the moment to borrow on terms which make him in effect the lender's slave.

[1] I. 9.

[2] 1258 ^{b}2–8. For Aristotle's doctrine and later developments from it cf. *Economica* for 1922, pp. 105–111.

Aristotle concludes the book by a discussion of the various sorts of rule that are proper in a household.[1] The slave has no deliberative faculty ; woman has, but it is without authority ; and the child has, but it is immature. Therefore the master's rule over the slave must be despotic, the husband's over the wife constitutional, the father's over the children monarchical. Thus the family contains in anticipation three of the main types of government.

Ideal Commonwealths

In Book II Aristotle devotes himself to a critical study of proposed ideal commonwealths, and of the most highly esteemed of historical constitutions and legislators, with a view to eliciting the best that has been thought and done in this field. He begins by a criticism of Plato's *Republic*. He first examines Plato's proposals for the community of women and children ;[2] his main arguments are two in number. (1) Plato is wrong in his principle ' the greater the unity of the state the better.' It is the very nature of a state to be a plurality, and a plurality of dissimilars. It differs from a nation, which Aristotle conceives of as an undifferentiated aggregate. In a state there is a diversity of functions, which may be summed up by saying that some have to rule and others to be ruled. Here Aristotle seems to forget Plato's actual arrangements. Plato is well aware of the diversity of functions in the state, and provides accordingly three clearly-distinguished classes. It is only within two of these, the ruling and warrior classes, that community of wives and children is ordained, and only within these classes that Aristotle would be justified in saying that Plato aims too much at unity. (2) Even if unity were a correct ideal for the state, it is not likely to be produced by Plato's arrangements.[3] Plato thinks unity will be attained if all men say ' mine ' or ' not mine ' of the same things. But, Aristotle points out, though a child in the Platonic state is the child of all the citizens in the sense that he is adopted by the community, he is not the child of all in the sense that he is the child of each. No man will have the same feeling towards him or bestow the same care on him as he would on a child which was veritably his own. What is everybody's business is nobody's business. Each citizen will have a thousand sons and each son a thousand fathers ; it is but a watery friendship that will in these circumstances spring up.

[1] I. 12, 13. [2] II. 2–4. [3] II. 3.

How much better is it to be a real cousin than a Platonic son!

Aristotle's argument is that intensity of affection can only be had by a sacrifice of extension. Plato's introduction of the crèche and the orphan-school, not to replace parents when they are dead or unfit for their responsibilities, but to replace them in all cases, is not likely to produce the affection he desires. Aristotle's faith in existing institutions, his refusal to be blinded to their uses by their abuses, is here justified. Rightly did Hegel say that Plato in comparison with Aristotle is 'not ideal enough,' if idealism is the power of seeing the ideal elements in the actual in preference to destroying the actual in the hope of finding the ideal elsewhere.

With regard to property [1] Aristotle distinguishes three possible variations from existing practice—

(1) Private property in land, common use of the produce.
(2) Common property, private use.
(3) Common property, common use.

He points out that (*a*) in a system of common property those who work hard and get little will have a grievance against those who work little and get much. (*b*) A common life and especially common ownership of property is a great source of disputes, e.g. among fellow-travellers. (*c*) Men are more efficient when set to work at that which is their own. (*d*) The sense of property is a great source of pleasure, being a form of self-love. (*e*) The use of property to help one's friends is a further source of pleasure, and an opportunity for the exercise of virtue. (*f*) The quarrels that arise over private property are due not to its being private but to the wickedness of human nature. (*g*) Plato is aiming at excessive unification. Not thus but by education should the state be made into a community. (*h*) Plato seems to contemplate that community is to apply to the guardians only; why has he not had the courage of his convictions and applied it to the husbandmen as well? (*i*) It is no use depriving the guardians of happiness and saying it is enough to make the state happy. Happiness can only be enjoyed by individuals. For all these reasons Aristotle advocates the first of the three alternatives—private property, common use—as against the other two. We might illustrate his meaning by saying that it is the sort of arrangement under which rich men give to the public the freest admission that is practicable to their picture-galleries, their parks, and their moors. In so far as socialism means a better organisation of industry by the

[1] II. 5.

state, Aristotle would be in sympathy with it, for he has a far more positive view of the state's functions than the *laissez faire* school of individualism. But in so far as it means the taking away from private industry of its rewards, the attempt to create an equality of possessions which the natural inequality of capacity and industry will constantly upset, he is an individualist, and no one has better expressed the common sense of individualism. It will be noticed that he does not much emphasise the main economic argument for individualism—that men will work harder if the fruits of their industry are to be reaped directly by themselves and by their children than if these are to be thrown into a common fund. He has already condemned the heaping up of riches beyond what is needed for the purposes of life and good life. His citizens are not to be engaged in industry, and they are not to make profit out of their public services. His argument is at bottom that property, like the family, is a natural and normal extension of personality, a source of pleasure and an opportunity of good activity. To pool wealth is to try to get rid of selfishness by act of parliament, but the sources of selfishness lie too deep to be removed by legislation; they lie in the wickedness of men. And the cure for them, as Plato also really thought, consists in education—the education in the 'spirit of the constitution'[1] which will lead people to use their wealth generously and to acquiesce freely in the common use of what they individually own.

In a later chapter[2] Aristotle considers proposals for the equalisation of property. He argues that the growth of the population tends continuously to upset any equalisation of property that may have been established; that it is not the possessions but the desires of mankind that need to be equalised; that it is only petty crimes that are caused by want and can be cured by such proposals; that the wealth of the citizens should be determined by a consideration not only of the welfare of the community but of the necessity for its being able to repel foreign foes. The conclusion of the whole matter is that 'it is better to train the nobler sort of natures not to desire more, and to prevent the lower from getting more.'

The State and the Citizen

In Book III. we come to the central and most fundamental part of the *Politics*. The question first propounded is the

[1] 1337 a14. [2] II. 7.

question 'what is a state?' The problem has for Aristotle a very practical meaning; it arises out of attempts on the part of a new government to disclaim responsibility for the acts of a deposed government on the ground that they were not acts of the state. Since a state is composed of citizens, Aristotle begins by asking who and what is a citizen. (1) Residence in a particular place does not make a citizen, for resident aliens and slaves also reside in the same place. (2) The right of suing and being sued does not make a citizen, for this may be secured to resident aliens by treaty. Such persons are citizens only in a qualified sense, as are those who are too young or too old to be citizens proper. (3) Descent from citizens is not what makes a citizen; for what of the first citizens?[1] The characteristic of the citizen proper is a share in the administration of justice, and in membership of the governing assembly. But when species of a genus can be arranged in order of merit, as can the types of constitution, they have not much in common. Hence the meaning of 'citizen' differs according to the form of government. The definition given is best adapted to democracy; in other states, such as Sparta and Crete, it is only the holders of certain determinate offices, not all citizens, that legislate and judge.[2]

Aristotle's conception of a citizen is widely different from the modern conception, because it is not representative but primary government that he has in view. His citizen is not content to have a say in the choosing of his rulers; every citizen is actually to rule in his turn, and not merely in the sense of being a member of the executive, but in the more important sense for Aristotle of helping to make the laws of his state; for to the executive is assigned the comparatively small function of supplementing the laws when they are inadequate owing to their generality.[3] It is owing to this lofty conception of a citizen's duties that he so closely narrows the citizen body. The husbandman or the labourer, who might be thought capable of choosing his representatives, is naturally enough deemed incapable of actually ruling.[4] But in this Aristotle is not only sacrificing the educative effect of political privileges on those who are initially but little qualified to exercise them, but by leaving the great bulk of the population unenfranchised he is endangering the stability of the state.

The citizenship of the city-state not merely excluded large numbers of the population of the city but, since it implied

[1] 1275 b21–34. [2] III. 1. [3] III. 16. [4] III. 5.

membership of the ecclesia and the juries, could not be extended either to colonies or to subject cities. It is the feudal conception of allegiance to a personal sovereign that has enabled modern states 'to bind, not only conquered populations to their conqueror, but also distant colonists to their mother country.'[1]

'Citizen' having now been defined, we may define the state as a body of citizens sufficing for the purposes of life. Aristotle returns[2] to his original question, what is or is not an act of the state. This runs up into the question wherein consists the identity of a state. In identity of place and of inhabitants? Clearly not. A compound changes when the law of its composition changes; the Dorian and the Phrygian mode contain the same sounds, but are not the same mode. Similarly the sameness of the state consists *mainly* in the sameness of the constitution. This, however, is without prejudice to the question whether a new government should fulfil the obligations of the old.

A further point about the citizen is next brought out.[3] The excellence of all citizens is obviously not the same, since they have different parts to play in the state. But they have a common object: the safety of the state. And we must not suppose that the virtue of ruler and that of subject are so different that the ruler need not have the virtues of a subject. The opposition between knowing how to rule and how to obey does exist in the case of menial offices; the master need not know how to perform these. But the knowledge of how to rule as a freemán over freemen can be got only by giving obedience as a freeman to other freemen, as military command can only be learned by military obedience. Directive wisdom only is peculiar to the ruler; all his other virtues must belong to the subject as well.

There are in this connexion two closely allied questions which it is easy to confuse, viz. What is the essence of citizenship? and What are the qualifications for citizenship? It is the latter question that is answered when it is said 'a citizen is one whose father and mother were citizens.' It is the former that chiefly interests Aristotle; but the true answer to the latter follows from the true answer to the former. If to be a citizen is to perform certain functions, the qualification for citizenship is capacity to perform these. In answering the question 'what is it to be a citizen?' Aristotle relies partly on his own reason-

[1] E. Barker, *Political Theory of Plato and Aristotle*, 299.
[2] III. 3.
[3] III. 4.

ing, partly on the ordinary usage of the word. A citizen must be a member of a city-state, not a mere adherent nor a mere means to its existence. What then are the minimum functions of a member ? Legal status, the right to sue and be sued, is not enough. Here he appeals to ordinary usage ; these rights are accorded to many who are not called citizens. In his selection of the functions which are to constitute the citizen, Aristotle follows the Athenian practice of his time ; to be a juryman and a member of the assembly—these are the minimum functions. The former must seem somewhat accidental to the notion of a citizen. There may be modes of government in which there is no jury system and yet citizenship is widely diffused. Again, membership of the sovereign assembly is no necessary part of citizenship ; Aristotle fails to foresee the possibilities of representative government. It is in the possession of a voice in the choosing of the members of the assembly that we should be inclined to find the minimum of citizenship.

Aristotle's exclusion of the mechanic class from citizenship may excite surprise. The reason which actuates him is that 'the life of a mechanic is incompatible with the practice of virtue.'[1] For this there are two grounds. (1) The first is lack of leisure. This argument loses its force with the invention of representative government. The mechanic may not have time to sit in the sovereign assembly, but that is no reason why he should not have a vote. (2) Aristotle holds that manual toil actually deliberalises the soul and makes it unfit for enlightened virtue.

Plato admits labour to citizenship while Aristotle excludes it, but in effect there is little difference ; for Plato assigns to it no political function but that of obedience, while Aristotle, just because it is not in his view capable of any higher function, declines to admit it to citizenship. The difference between them turns simply on the definition assigned to citizenship. Labour in Plato's state is just what Aristotle would call not a part of the state but a means to its existence. We can hardly doubt that Aristotle has here, as not seldom elsewhere, applied somewhat hastily his favourite formula of end and means. Society cannot in fact be split into two parts of which one is merely a means to the welfare of the other. Every human being is capable of a life worth living for itself, and it is the business of the state to secure rights for its humblest as well as for its most cultivated members. Purely equalitarian theories of the

[1] 1278 a20.

state go too far in this direction. They tend to ignore the differences of capacity which in fact make some men more capable of living the 'good life' than others, and Aristotle's theory is of value in reminding us that inequalities exist. But no simple division of the population into parts of the state and mere conditions of its existence does justice to the complex gradation of capacity, or to virtue's power—elsewhere emphasised by Aristotle—of 'shining through'[1] unfavourable circumstances.

Classification of Constitutions

From considerations about citizenship Aristotle passes to the classification of constitutions.[2] A constitution is defined as the arrangement of magistracies in a state, and especially of the highest offices. The nature of the constitution depends on the seat of authority. Now the state owes its formation to men's being brought together by their common interests. The case is different from that of the association of master and slave, where it is essentially only the master's interests that are considered, and the slave's only in so far as, if the slave deteriorates, the master suffers. Only governments, therefore, which aim at the common interest are true governments; those which regard only the interest of the rulers are deviation forms. Thus the motive of government gives us the main division among governments. Within each of these two kinds we may have governments by one, by few, or by many.[3] Thus we get:

Right constitutions	*Deviation forms*
Kingship	Tyranny
Aristocracy	Oligarchy
Polity[4]	Democracy

This classification is in the main borrowed from that found in Plato's *Politicus*,[5] but the principle of division there is different; constitutions are distinguished according to their respect or disrespect for law (a distinction which Aristotle uses to mark off the sub-species of democracy and of oligarchy from each

[1] *E. N.* 1100 b30.

[2] III. 6–9.

[3] III. 7.

[4] A. gives this constitution, for want of a recognized term, the generic name πολιτεία, "constitution." In *E.N.* 1160 a36 he calls it timocracy, the constitution based on a property qualification.

[5] 297 c–303 b.

other). Further, within each of the two main groups Plato distinguishes the three species by the number of the rulers, whereas Aristotle prefers a qualitative distinction. For a difficulty arises from the use of a purely numerical distinction.[1] Government by a *rich* majority is not democracy, nor government by a *poor* minority oligarchy. But if we include the degree of wealth as well as the comparative number of the governing body in our definition, and define oligarchy as government by a rich minority and democracy as government by a poor majority, we shall be leaving out two of the four possible combinations. The numbers are really irrelevant; oligarchy is essentially government by the rich, democracy government by the poor. From this point of view polity is essentially government by the middle class.[2] A division of the population into rich or notables and poor or demos, with the addition sometimes of middle class, is for the most part the working basis of Aristotle's classification.[3]

Elsewhere indeed,[4] combining the two principles, he defines democracy as government by a poor majority, oligarchy as government by a rich minority. But this is in a part of his work in which he is emphasising the distinctions to be found within the main types of constitution, and we must suppose that it is only democracy and oligarchy of the straitest type that must satisfy the double condition. In another passage the rulers in an oligarchy are stated, more fully, to be characterised by good birth, wealth, and education, those in a democracy by low birth, poverty, and mean employment.[5]

There is another way of stating the difference between constitutions. You may ask what the principle is on which office is assigned. The answer as regards oligarchy will be 'wealth'; that is what oligarchies regard as the most important thing in the state, and it is naturally on the basis of men's contribution to the wealth of the country that oligarchies assign office. But poverty is not the ground on which democracies assign office; they assign it on the basis of free status, and equally to all freemen. Again, the basis on which power is assigned in monarchies and aristocracies is not the singleness of the monarch or the fewness of the rulers but the supreme virtue of the monarch or the comparative virtue of the ruling class. Similarly polity assigns office on the joint principle of wealth and numbers, or,

[1] III. 8. [2] IV. 11.
[3] 1291 b15 ff., 1295 b1 ff., 1302 b40–1303 a13, 1304 a38–b4.
[4] 1290 a30–b20. [5] 1317 b38.

as Aristotle sometimes says, on the basis of a humbler type of virtue, that of a citizen army; while the tyrant's power is based on force and fraud.

Elsewhere [1] a different analysis of the state makes its appearance. If we were enumerating the species of animals we should first determine the organs necessary to animal life, and their various forms; the possible combinations of these will yield as many varieties of animal. The organs of the state are the food-producing class, the mechanic class, the trading class, the serfs, the warriors, the judges, the class that discharges costly public services, the official class, the deliberative body.[2] To this functional analysis of the state will correspond the classification of constitutions. But one person may discharge more than one of these functions, while no one can be both rich and poor; hence the common view which classifies constitutions into democracy and oligarchy. This functional treatment of the state might have been made the basis of a more valuable classification than Aristotle actually offers; but though it occasionally reappears in the *Politics* [3] it is not worked out to its consequences.

The adoption of these various points of view makes Aristotle's classification of constitutions difficult to follow. But it leads in fact to but little cross division, and it serves to make his notion of the various constitutions more concrete than the adoption of any one basis would have allowed it to be. We may well keep in mind his own caution against the classifying of real kinds on any single principle of division.[4]

Both his main principle of division and his principles of subdivision are still in common use in distinguishing between constitutions. The former answers to our distinction between constitutional and despotic government; and we still distinguish much as he did between monarchy, aristocracy, oligarchy, and democracy. But other lines of demarcation between governments have become equally important, e.g. between primary and representative government; between unitary states, federations, and empires; between centralised and decentralised governments; between written and unwritten, flexible and inflexible constitutions. Nor is it so easy to say of a representative as of a primary government whether it is monarchical, aristocratic, or democratic.

[1] 1290 b22–1291 b13.
[2] Add from 1328 b2 ff. the priestly class.
[3] 1297 b39, 1316 b39 ff., 1328 a21 ff.
[4] *P.A.* I. 1.

In one of the finest chapters in the *Politics*,[1] Aristotle points out that the claims of aristocrats, oligarchs, and democrats depend on different applications of the conception of justice. All are agreed that justice is equality for equals, inequality for unequals. The question is what constitutes equals and what unequals. Those who are superior in wealth think themselves superior in everything, and claim that their share in the state should be proportioned to their property. Those who are equal to others in free status think themselves equal in all respects and claim that all freemen should have equal political rights. Hence come oligarchy and democracy. But the state exists neither for alliance and security from injustice (in which case each man should count for one and no man for more than one), nor for exchange of goods (in which case the wealthy should have the power). If wealth were the object of the state, two states which have commercial agreements would be one state. A single state must have common magistracies and a regard for the goodness of all its members. Without the moral end a state becomes a mere alliance, and law a mere convention and security against injustice without any positive power to make men good. Two states united by a wall do not make one state even if they have rights of intermarriage or of commerce. It is not so much their distance that makes two states not one state, but the limited nature of the objects of their intercourse. A state is a community of well-being, for the sake of a perfect and self-sufficing life. Community of place, intermarriage, laws to prevent crime and to regulate commerce are necessary conditions of a state but do not make one. If, then, the state exists for noble actions, power should go neither to the free nor to the well-born nor to the rich but to the good. Those who interpret equality in terms of anything short of goodness 'are speaking only of a part of justice.'

No higher or more positive ideal of the state has ever been expressed than this. We can recognise its superiority to the 'administrative nihilism' of which Huxley speaks, the 'policeman' theory of the state according to which it should interfere with individual liberty only when the individual is proposing to interfere with the liberty of others. But we may ask whether Aristotle does not go too far towards the opposite extreme of 'regimentation.' He does not believe that men can be made moral by act of parliament. But he believes that the state by affixing rewards and penalties to certain types of act can pro-

[1] III. 9.

duce a habit of doing good and refraining from evil. This is not morality, but he holds that it is a precondition of morality, and that on it morality tends to follow. And experience surely indicates that he is right.

The remainder of Book III. is a long debate in which the merits of the various right constitutions are impartially discussed with a view to determining which is the ideal; Aristotle's answer to this question is most distinctly given in the last two chapters. At the same time he frequently recurs to another question, viz. whether men or law should be supreme.

At first the balance leans towards government by the many. Four reasons are given for allowing a certain value to the claim of the many to rule. (1) Many ordinary persons may collectively be better than a few good ones. Aristotle speaks as if wisdom and virtue could be pooled, and assumes too readily that in other spheres, e.g. in judging of music and poetry, the opinion of the many is preferable to that of the few. Yet in practical affairs there is much truth in his contention. It often happens that a scheme devised by one or a few clever people is found, when the common sense of a number of ordinary people is focussed on it, to present defects not suspected by its authors. It is often remarked that a committee is wiser than its wisest member. Aristotle does not admit the universal applicability of this argument. He points out that in any case it is only an argument for allowing some *collective* functions to the many, not for assigning executive office to individuals of the less educated class. (2) The permanent exclusion of the multitude from all share in office is dangerous because it produces widespread discontent. (3) In particular, there is much to be said for assigning the choice, and the re-election or dismissal, of rulers to the people in general. With regard to the latter function, the intelligent layman is in any art as likely to judge correctly as the expert. And with regard to the former, the user is a better judge than the builder of the excellence of a house, the guest a better judge of a feast than the cook. A man is not a fit judge of his power to rule or of the excellence of his actual rule; the rulers should be placed in office, and should be removable from office, by those who benefit or suffer by their rule—by the wearers who know where the shoe pinches.[1] (4) The individual is likely to be overcome by passion; a multitude are unlikely all to get into a passion at once.[2] Aristotle is here treating the crowd as if they were isolated indivi-

[1] III. 11. [2] 1286 ^{a}31–^{b}7.

duals, and applying the laws of probability on that hypothesis. He is ignoring the fact that the crowd is apt to be carried away by the passion of its most passionate members. But he himself admits only the conclusion that a number of equally virtuous men are less likely to go wrong than one man of virtue equal to theirs.

One case emerges in which the claim of the many must clearly go to the wall.[1] It is the improbable case in which one man in a state transcends not only all others individually but the whole mass of them in excellence. It would be absurd to make laws for such a man. What democratic states do with such men, knowing that they cannot absorb them, is to ostracise them; but the only proper course is to obey them joyfully. This—the monarchy of the perfect man—is for Aristotle the ideal constitution. But he knows that such men are seldom or never found.

Monarchy

This naturally leads to a more explicit discussion of monarchy.[2] Aristotle enumerates five types of monarchy—the Spartan type (irresponsible and perpetual leadership in war, together with the supervision of religion) and absolute monarchy, with three intermediate forms. The Spartan or minimal type need hardly be considered. It is not a separate form of constitution, for any constitution might recognise a perpetual commander-in-chief. We need only consider the maximal type.[3] The merits of monarchy are considered with reference to the arguments already put forward in favour of the claims of the many, and the conclusion is drawn that the rule of many good men, i.e. an aristocracy, is better than the rule of one man no better than they. Incidental objections to monarchy are pointed out. A king will naturally wish to transmit his power to his descendants, and there is no guarantee that they will be worthy of it. A king must have guards, and may use them improperly. But the question mainly discussed is whether a king or the law should be supreme.[4] On the one hand it may be said that the law, which is passionless reason, should be supreme; on the other, that law will have the colour of the possibly imperfect government which set it up.

[1] III. 13. [2] III. 14–18. [3] III. 15.
[4] 1281 a34–39, 1282 b1–13, 1286 a7–24, 1287 a18–b23.

It may be argued that law owing to its generality cannot provide for all particular cases ; that it would be absurd for medicine or any other science to proceed by fixed rules. But where the law cannot determine, can an individual do so ? Nor is the parallel of medicine conclusive. A physician has no motive for not doing his best for his patient, but rulers are often moved by spite and partiality. Again, if written law be deemed too inflexible, we may fall back on the more important kind of law which is unwritten and customary. The conclusion is that law should be followed wherever possible and that individuals should be left to deal only with the particular cases on which the law is silent.

Aristotle's view here is somewhat peculiar. For where does law itself come from ? It must have been established by a government of one, few, or many, and must be exposed to the defects of its originators. His meaning to some extent answers to our distrust of administrative action uncontrolled by the legislature. But he would go further than this. He distrusts even the decrees of the ecclesia—the nearest Attic equivalent to Parliament—and thinks that Athens is being ruined by her preference of decrees to laws. He would not be content with a system under which Parliament in its day-to-day activity can make anything legal and anything illegal, and would prefer elaborate precautions against fundamental changes in the law. He would have law relatively permanent, and would confine the functions of the legislature to the supplementation of the laws, their alteration being regarded as something exceptional.

The relation of a king to his subjects, Aristotle concludes,[1] is not necessarily an unnatural one, any more than that of a master to his servant. All depends on two things—(1) that the king should seek the welfare of his subjects, not his own, and (2) that he should be indisputably superior to them in excellence. In fact we cannot pronounce which is the best government for a people without taking account of the special nature of that people. Is it one in which a single man or family stands out above the rest in virtue ? Then it is best governed by a king. Is it a body of people who can be ruled as freemen by men whose excellence makes them capable of political command ? Then it is best ruled by an aristocracy. Is it a people in which ' there naturally exists a warlike multitude able to rule and to obey in turn by a law which gives office to the well-to-do according to their desert ? ' Then it is fitted for a polity. Aristotle's

[1] III. 17.

preference is for the monarchy of a 'god among men,' since superior virtue is more likely to be found in one man than in any larger number. But this he recognises to be an almost impossible ideal, and accordingly the ideal state which he proceeds to depict is an aristocracy, a government by men of high and enlightened virtue, in which no one is admitted to citizenship who is not so qualified, and in which all citizens rule and are ruled in turn. But this again he sees to be an ideal pitched almost too high for human nature, and accordingly he later puts forward as a practicable ideal for the Greek states of his time the polity, in which the qualification for rule is not high and enlightened virtue but the sturdy military virtue of a middle class. Democracy, he feels, has in all probability come to stay,[1] and the most practical thing a statesman can do is to make it safe for the world by mixing with it a strong dash of oligarchy.

Morphology of the State

With Books IV.–VI. we reach what was originally, it would appear, a separate treatise, a treatise more technical in character than the rest of the work, dealing in detail with the species and sub-species of constitution. Of the six forms of government, monarchy and aristocracy have been discussed;[2] it remains to discuss polity, tyranny, oligarchy, democracy.[3] The latter two are discussed in opposition to each other in IV. 3–6, polity in IV. 8, 9, 11, tyranny in IV. 10.

It is laid down as axiomatic that tyranny, being the perversion of the best government, must be the worst, oligarchy the next worst, and democracy the most tolerable of the three perversions, though never other than a perversion. Aristotle next lays down a programme for his further discussion; we are to enquire

(1) how many varieties of constitution there are (IV. 3–10),

(2) what constitution is the best adapted to normal circumstances, and the next best after the ideal constitution (IV. 11),

(3) which of the inferior kinds of government is suited to each kind of population (IV. 12),

(4) how these forms are to be established (IV. 14–16, VI),

(5) how constitutions are destroyed and preserved (V).

[1] 1286 ᵇ20.

[2] Aristotle adds in IV. 7 (cf. 1293 ᵇ33–42, 1294 ᵃ19–25) a note on three types of aristocracy loosely so called.

[3] IV. 2.

Aristotle recognises five different types of democracy, distinguished both by the nature of their institutions and by the nature of the population in which they spring up.[1] There is (1) the democracy based strictly on equality, the rich man counting for no more than the poor nor the poor than the rich.[2] There is (2) that in which magistrates are elected on the basis of a low property qualification. This is the constitution natural to an agricultural or pastoral people, which according to Aristotle is the best material for democracy. The advantage about such a population which he somewhat cynically emphasises is that they will be too busy and too remote to do more than attend infrequent meetings of the assembly to elect magistrates and call them to account, and will willingly hand over their government to their betters; what makes it in his eyes a good democracy is that it is hardly a democracy at all. In such a state, law does not suffer from the invasion of decrees; the best men rule and yet are subject to the check imposed by popular election.[3]

After two intermediate types[4] we get (5) the type in which service in the assembly is paid and decrees tend to supersede law; the people is swayed by demagogues; the rich are victimised; the authority of magistrates is undermined; the artisan and the labourer are supreme. This is closely akin to tyranny and, like it, is for Aristotle hardly a constitution at all.[5] He recognises not only a historical tendency for constitutions to pass from the monarchical form through aristocracy, oligarchy, and tyranny to democracy, but for democracy to run its course from the most moderate to the most extreme form.[6] Similarly four types of oligarchy[7] and three of tyranny[8] are distinguished.

Aristotle passes next to a constitution which owing to its rarity had been overlooked by his predecessors,[9] viz. polity.

[1] Cf. 1317 ^{a}18–33.

[2] This type is distinguished only in 1291 ^{b}30–38; in IV. 6 and in VI. 4 it is taken along with the second, from which it seems to differ by having no property qualification.

[3] 1291 ^{b}39–41, 1292 ^{b}25–33, 1318 ^{b}6–1319 ^{a}24.

[4] For the third see 1292 ^{a}1, ^{b}34–38, 1317 ^{a}24–29, 1319 ^{a}24–^{b}1; for the fourth 1292 ^{a}2–4, ^{b}38–41.

[5] 1292 ^{a}4–37, ^{b}41–1293 ^{a}10, 1296 ^{b}26–30, 1298 ^{a}28–33, 1317 ^{a}24–29, 1319 ^{b}1–11.

[6] 1286 ^{b}8–22, 1292 ^{b}41, 1297 ^{b}16–28.

[7] 1292 ^{a}39–^{b}10, 1293 ^{a}12–34, cf. 1298 ^{a}34–^{b}5, VI. 6.

[8] IV. 10.

[9] IV. 7.

This is a fusion of oligarchy and democracy, but the term (he points out) is usually applied to the fusions which tend towards democracy, while those which tend towards oligarchy are loosely called aristocracy.[1] The characteristic of polity is that it takes account both of wealth and of free status in its distribution of office. Three methods of fusion are indicated.[2] Two of these consist in borrowing institutions, in whole or in part, from both forms of government. The third is the adoption of a mean between the enactments of the two. Thus polity will naturally steer a middle course between oligarchy and democracy by neither having a high property qualification foroffice nor none at all. It will in fact entrust power to the middle class; and this is the characteristic of it which Aristotle later chiefly emphasises.

We can now say what is the best constitution for most states, leaving out of account the ideal state which is only an aspiration.[3] We have learned in the *Ethics* that the happy life is the life in a mean. The gifts of fortune when present in excess or in defect make it difficult for us to follow reason. Those who have too much tend to violence, those who have too little to petty roguery. The former do not learn even at school the habits of obedience, and consequently cannot obey; the others can never command and must be ruled like slaves. Thus arises 'a city of masters and slaves, the one despising, the other envying.' Happy therefore is the city which has a large proportion of middle-class citizens able to hold the balance between the extreme parties. This class is the only one which need not fear a coalition of its opponents; rich and poor will always (so Aristotle maintains) trust the middle class rather than one another. In the absence of such a class there arises oligarchy or democracy, and either may easily pass into tyranny. Democracies are, however, safer than oligarchies because they tend to have a larger middle-class. Most governments have been democratic or oligarchic simply because the middle class has been too small.

Aristotle does not illustrate his 'polity' by referring to any actual example except that of Sparta, but there is no doubt that he is thinking of the Athenian constitution of the year 411, in which power had rested with the 5,000 who possessed heavy armour, and the system of pay for attendance at meetings had been abolished. From the *Athenaion Politeia*[4] we learn that he, like Thucydides, regarded Theramenes, the author of

[1] IV. 8. [2] IV. 9. [3] IV. 11. [4] 28. 5, 33. 2.

this constitution, as one of the greatest of Greek statesmen.

He passes now to a more technical part of his subject—the discussion of the deliberative, executive, and judicial elements,[1] which he recognises here more clearly than elsewhere as the most vital parts of the state. His object is to show what arrangements with regard to each of these elements are appropriate to each form of constitution. The most noteworthy point in his treatment of the deliberative element is the recommendation that those who deliberate should be elected in equal numbers out of the different classes.[2] This would be representative government; but Aristotle does not recognise its far-reaching importance. He considers next the executive,[3] and distinguishes the various modes of appointment according as

(1) all, or some, of the citizens appoint,

(2) all the citizens, or a class (distinguished by a property qualification, birth, or merit), are eligible,

(3) appointment is by vote or by lot.

Again, the two alternatives under any of these heads may be combined so that e.g. *all* the citizens appoint to some offices, only *certain* citizens to other offices. There are thus 3 × 3 × 3 possibilities. Aristotle reviews most of these and assigns them to the constitutions to which they are appropriate. Elsewhere he gives an interesting detailed account of the machinery of government (*a*) essential and (*b*) desirable in a state.[4]

He continues in Book VI. to discuss in detail the proper organisation of democracies (chs. 1–5) and of oligarchies (chs. 6, 7). The leading notes of democracy he finds to be a claim to equality without regard to differences of merit, and to liberty interpreted as licence to 'do what one pleases.'[5] The union of these two claims produces the demand that one shall either not be ruled at all, or shall at least have one's turn of ruling. To these sources Aristotle traces the constitutional arrangements which tend to be found more or less in all democracies. But it is a mistake, he urges, to suppose that the most truly democratic measures are those which will establish democracy in its most characteristic form; the measures most advantageous to such a government are those which will make it last longest.[6] Not to victimise the opposing class but to treat it with generosity is the truest wisdom. Again, though payment of the people for attendance at meetings is characteristic of

[1] IV. 14–16. [2] 1298 b21–23. [3] IV. 15. [4] VI. 8.
[5] VI. 2.
[6] VI. 5, cf. 1309 b18–1310 a36, 1313 a20–33, 1321 a26–b1.

democracy, the wise democrat will not push this to the point of pauperisation—though he will be forward in devising measures for setting up the poorer citizens in farms or businesses and thus promoting their prosperity and self-respect.

Pathology of the State

Aristotle now turns to the causes and course of revolution and the means of preventing it. Book V. contains a vast amount of historical information, but what is more to our purpose is the ripe political wisdom which Aristotle shows both in diagnosing the causes and in prescribing the cure for the diseases of the body politic.

There are, he points out, varying degrees of revolution. It may take the form of a change of constitution, or its authors may leave the constitution unchanged and be content to get power into their own hands. Again, a revolution may merely make an oligarchy more, or less, oligarchic, or a democracy more, or less, democratic. Or, finally, it may be directed against some one institution, and leave the form of government otherwise unchanged.

Aristotle first occupies himself with the general causes of revolution. Its spring is found in the one-sided and perverted notions of justice that men entertain. Democrats think that because men are equally free they should be absolutely equal; oligarchs, that because men are unequal in wealth they should be absolutely unequal. This is the *state of mind* of the revolutionary.[1] His *objects* are gain and honour, or the avoidance of loss and dishonour. The *causes* which lead to his state of mind are indignation at the engrossment of gain and honour by others, insolence, fear, undue predominance of individuals, contempt, disproportionate increase in some part of the state, election intrigues, carelessness in the admission of disloyal persons to office, neglect of small changes, dissimilarity of elements in the state. Aristotle's wealth of historical knowledge enables him to illustrate aptly these causes of revolution.[2]

He next examines the causes of revolution in particular kinds of state—in democracies (ch. 5), in oligarchies (ch. 6), and in aristocracies and politics (ch. 7). Democracies are usually overthrown by the excesses of demagogues, which lead the rich to combine against the government; or demagogues may set

[1] V. 2. [2] V. 3, 4.

up a tyranny. Oligarchies are overthrown (1) by revolts due to their oppressive rule, or (2) by rivalry between the oligarchs themselves, which leads them to play the demagogue. In aristocracies revolutions are sometimes due to the honours of the state being restricted to too small a circle. Usually, however, the downfall of an aristocracy or a polity is due to the ill-mingling of the democratic and oligarchic elements. Polity tends to change into democracy, aristocracy into oligarchy. But reaction sometimes turns a polity into an oligarchy, an aristocracy into a democracy. The effect of foreign influence in producing revolution is also noticed.[1]

The preventives of revolution are next considered.[2] The most important thing is to maintain the spirit of obedience to law, especially in small matters ; the beginnings of change must be watched for. The second rule is, not to rely upon devices for deceiving the people, which are proved by experience to be useless. Further, both aristocracies and oligarchies may last, not from any inherent stability in the constitution, but because the rulers are on good terms with their subjects, never wronging the ambitious in a matter of honour nor the common people in a matter of money, but introducing the leading spirits to a share in rule, and adopting to some extent democratic institutions. The ruler should also keep before his people the danger of foreign attack, and should if necessary invent dangers to alarm them. The governing class must by all means preserve its own solidarity. The political effect of changes in the distribution of wealth should be carefully watched. No individual or class should be allowed to become too strong ; rich and poor should be set to check each other, or power should be given to the middle class.

A point which Aristotle much emphasises is that the rulers should have no opportunity of making money out of their office. He exaggerates, perhaps, the extent to which the common people are content to be without power so long as they do not suspect their masters of robbing them. Accordingly he provides for the most careful scrutiny of the accounts of magistrates. So far from advocating that oligarchies should repress the poor and democracies the rich, he points out how important it is that the ruling party should be particularly scrupulous in its behaviour towards the ruled. The latter should be given equality or preference in all offices but the highest.

[1] 1307 b19–24. [2] V. 8, 9.

For the highest offices three things are needed—loyalty to the constitution, administrative capacity, and integrity.[1] How are we to choose when we cannot get all three? We must consider what qualities are common, what qualities are rare. In the choice of a general we must consider skill rather than integrity, for military skill is rare; in the choice of a financial officer, we must consider integrity, for the necessary knowledge is common. This is one of the few passages in which Aristotle says much about the fitness of candidates for the particular work of the offices for which they are standing. Usually he speaks of justice, and thinks of office as the reward of virtue. This is partly due to the Athenian practice of subdividing executive power among many boards, so that no individual official could do much good or much harm. But it is more important to remember that the word we translate 'virtue' stands for intellectual as well as moral excellence, and that at bottom both Aristotle's principle and ours mean that the fittest to rule should rule.

Many apparently democratic practices, he points out, are the ruin of democracies, and oligarchical practices of oligarchies. Democracy and oligarchy must not be pushed to extremes, or they will destroy themselves; the mean must be sought. But above all, education must be adapted to the form of government; men must be trained 'not to perform the actions in which oligarchs or democrats delight, but those by which the existence of an oligarchy or of a democracy is made possible.' Young oligarchs must not be brought up in luxury, nor young democrats in the notion that freedom consists in doing as you please. 'Men should not think it slavery to live according to the rule of the constitution; for it is their salvation.'

Aristotle has still to speak of the causes and preventives of revolution in monarchies and tyrannies.[2] Monarchy is of the nature of aristocracy; tyranny is a fusion of extreme democracy and extreme oligarchy. What has been said of these forms of government is therefore true of monarchy and tyranny. Royalty is preserved by the limitation of its powers.[3] Tyranny may be preserved (1) in the traditional way, by humiliating the people, sowing mistrust among them, and taking away their power, or (2) by making the tyrant's rule more like that of a king; the tyrant must appear in the light of the father of the state, the guardian of the citizens, a man of moderate life, the companion of the notables, the hero of the multitude.

[1] V. 9. [2] V. 10, 11. [3] V. 11.

'Thus will his disposition be virtuous, or at least half-virtuous; and he will not be wicked, but half-wicked only.'

The Ideal State

The books of the *Politics* which profess to deal with the best constitution[1] deal in fact little with constitutional questions. They turn out to be a general essay on the construction of an ideal state, and are occupied more with its educational arrangements than with anything else.

In order to depict the ideal constitution we must first determine which is the most eligible life. Aristotle begins by recapitulating certain doctrines which belong properly to ethics. All goods may be divided into external goods, goods of the body, and goods of the soul, and the happy man must have all three. But all are not of equal value, for (1) experience shows that a high degree of virtue combined with moderate external goods produces more happiness than great external goods with little virtue. External goods are good for us only when we possess them up to a certain limit; beyond that they may be harmful. But no one would contend that a man can have too much virtue. (2) It is for the sake of the soul that goods external and goods of the body are eligible, not *vice versa*.

If virtue is the most important for the individual, it must be the most important for the state, which is a whole of individuals. But the state must have external goods enough for the performance of good actions.

Even if the life of virtue be granted to be the best, we may still ask[2] whether the life of business and politics or the contemplative life is the best. Some think that even constitutional rule over others is a hindrance to individual well-being; others —the admirers of the Spartan régime—that arbitrary rule alone consists with happiness; and in fact in most states, if the laws may be said to aim at anything, they aim at the maintenance of power. But (1) it cannot really be maintained that domination over others is right, unless those others are 'born to serve'; domination at all costs, irrespective of the merits of the case, cannot be justified; and (2) a city may be happy in isolation; the interplay of its parts may give sufficient scope for happy activity.

Both sides are partly right and partly wrong.[3] The first is

[1] VII., VIII. [2] VII. 2. [3] VII. 3.

right in thinking the life of the freeman better than that of the despot; wrong in thinking that all rule is despotic, and in placing inactivity above action. The second is wrong in thinking supreme power the best of all things. Domination is good only when it is over natural inferiors; but then it *is* good. Again, the life of action is not necessarily one that involves relations to others. Thought is itself an activity, and the highest activity since it is the most akin to the life of God.

From these preliminary remarks Aristotle passes to his picture of the ideal state.[1] Certain conditions are necessary, of which (1) the first is population. It is not mere numbers, least of all the number of non-citizens (husbandmen, traders, mechanics, labourers), that count, but the capacity to do the proper work of a city. A ship which is only a span long is not a ship at all, nor a ship a quarter of a mile long; and within these limits there are ships which *are* ships and yet too short or too long to sail as well as a ship can. A certain minimum of population is necessary if the state is to be self-sufficing. But if we go beyond a certain maximum, good government and order become impossible. 'Who can be the herald of such a multitude, unless he have the voice of a Stentor?' If the citizens are to judge, and to distribute offices according to merit, they must know each other's character; if the population is too great these things will go by haphazard. The state in short must be capable of being seen at a single view.

Both the minimum and the maximum here are indefinite. Aristotle's view that perfection depends on limit, not on mere size, supplies a wholesome corrective to the fanatical admiration of large empires. But the requirement of self-sufficingness, whether we take account of material, moral, or intellectual needs, justifies and indeed calls for a larger community than he thinks proper. We should regard Aristotle's view of the upper limit as in some respects parochial. We should not be disturbed at the fact that the population of Great Britain cannot be dealt with by one town-crier. In legal decisions, we think it better that the jury should not know too much about the general character of the parties, or if they do, should not take account of such knowledge. In the choice of our government we do not think it necessary that we should have personal knowledge of the persons we put in power; we usually know enough, if not too much, about their record. In regard to the orderliness of the governed, we may fairly say

[1] VII. 4–12.

that order can be maintained throughout a larger population than Aristotle contemplated.

(2) Territory.[1] This should be large enough to make a free-handed life possible, and not so large as to foster luxury. It should be hard of access to the enemy, easy of egress to the inhabitants; it, like the population, should be capable of being taken in at a single view. Communication with the sea is advantageous both for safety in war and for the provision of necessaries;[2] the common fear that the increase of population and the introduction of strangers brought up in an alien tradition will be adverse to order need not be too seriously entertained. But the city should be a market for herself, not for others; i.e. in her commerce she should aim not at unbounded wealth, but at the importation of the specific goods she needs and the exportation of her surplus.

(3) Character of the citizens.[3] The Greek race combines the high spirit of the northern races with the intelligence of the eastern. Hence it alone combines freedom with good government, and if it could be formed into one state, would be able to govern the world. The most perfect combination of intelligence with spirit is the best possible character for the citizens of a state.

Just as every natural compound requires certain conditions which are not organic parts of it, so a state besides its organic parts requires certain conditions.[4] In order to distinguish the parts of the state from its necessary conditions we must enumerate its functions. It must have (1) husbandmen, (2) artisans, (3) a warlike class, (4) a well-to-do class, (5) priests, (6) judges of what is just and expedient.[5]

How far should these functions be combined in the same person?[6] Artisans have not the virtue nor husbandmen the leisure needed for the performance of political duties. Again, different qualities are needed for our warriors and our judges or councillors—strength for the one, wisdom for the other. But those with whom the balance of strength resides will not consent to be permanently deprived of rule. Let us therefore make the same men our warriors while young, our rulers when older, and our priests when past active life. Finally, landed property should be in the hands of this class, not of the tillers of the soil,

[1] VII. 5, 6. [2] VII. 6.
[3] VII. 7. [4] VII. 8.
[5] Add from 1290 b39 ff. the trading class and the official class.
[6] VII. 9.

since these will not be citizens but slaves or barbarian serfs. Thus we get the scheme:—

(1) Warriors, who are later rulers, and later still priests, and all the time well-to-do.

(2) Husbandmen.

(3) Artisans.

Our six classes have been reduced to three. And only the first class is an organic part of the state.

Though Aristotle has argued against the common ownership of land, he provides for the nationalisation of part of it, for the purpose of defraying the costs of public worship and of the common meals which he values as a means of promoting unity.[1] With regard to the private land, each citizen should have a strip near the border and one near the city, so that the distribution may be just and all may be interested in the defence of the state's territory.

After drawing a particularly interesting and vivid picture of the arrangement of an ideal Greek city,[2] Aristotle attacks the subject which will occupy him to the end of Book VIII., the subject of education. Our object is to discover the best form of government, and this will be the form which gives the greatest opportunity of being happy. Now happiness depends primarily on virtue, and only secondarily on external goods; and virtue depends on three things—nature, habit, and a reasoned rule of life. Education is concerned with the latter two.

It will vary according as the functions of rule and obedience are to interchange or to be permanent.[3] Now in general none of our citizens will be so indisputably superior to the rest that they should be made permanent rulers. We should therefore train our citizens to become, first, good subjects, and by being such to become good rulers. There is nothing degrading in such obedience, since actions are honourable or dishonourable not so much in themselves as in the end to which they are directed. The end of man is obviously to be found in that part of him which can frame a rule and not in that which can merely follow one; i.e. in the reason. Reason, again, is of two kinds—practical and speculative, and of these the second is the higher. The first is concerned with war and in general with business, the second with peace and in general with leisure; and business and war evidently aim at securing leisure and peace. Hence there can be no greater political error—Aristotle is criticising the fashionable enthusiasm for Spartan institutions—than to

[1] VII. 10. [2] VII. 11, 12. [3] VII. 14.

treat war and dominion as the be-all and the end-all of a nation's existence. Men should first provide against their own enslavement; secondly, obtain empire for the good of the governed; and thirdly, seek to be masters only over those who deserve to be slaves. For national morality has the same rules as private morality; 'the same things are best for individuals and for states.' With all his zeal for the state Aristotle is entirely free from the delusion which places the state above morality or treats it as having a peculiar set of moral rules, more accommodating than those which bind individuals.

The body develops earlier than the soul, and the appetites earlier than the reason.[1] Therefore education will begin with the body, go on to the appetites, and deal with reason last. But it will train the body for the sake of the soul, and the appetites for the sake of the reason. The legislator's care for the rising generation should begin even before their birth.[2] Hence Aristotle proceeds to state his views on eugenics—on the proper age of marriage and the sort of constitution that parents should have. He adds precepts about the food, exercise, and amusements of children.[3]

Each mode of government is formed and preserved by a particular character in its citizens; and it must be the business of the state to foster this character by education, which should therefore not be left to the parents but be public and be identical for all the citizens. No citizen belongs to himself; all belong to the state, and the state must care for each of its parts.[4]

We cannot here go into the detail of the education which Aristotle proceeds to describe. It must be remembered that the education in question is the education of citizens, not of the classes which are conditions but not parts of the state. This explains both its uniformity, and the fact that it is so little utilitarian, so predominantly moral.[5] His citizens will never need to earn their living, so that professional and technical training is unnecessary. They are simply to be trained so as to make good soldiers and subjects, and, later, good rulers. And Aristotle, viewing the state as a directly moral agent, not as that which merely removes possible hindrances to good life, naturally emphasises moral education more than we tend to do. We too think of games and lessons as having a moral effect, but we think of this as less direct than he takes it to be, and we

[1] VII. 15. [2] VII. 16. [3] VII. 17. [4] VIII. 1.

[5] The section dealing with education in science and philosophy is missing.

think of them as more likely to have a good moral effect the less this purpose is obtruded on the attention.

Not only is the discussion of education left unfinished, but much else is lacking in the treatment of the ideal state. We are told nothing of the organisation or procedure of the deliberative assembly, the executive, or the judicature. Whether Aristotle's imagination failed him or part of the treatise has been lost we have no means of knowing. But he may well have thought, like Plato, that given good education all the rest that the state required would follow.

CHAPTER IX

RHETORIC AND POETICS

Rhetoric

THE Greeks were both a politically-minded and a litigious race, and the arts of speech were as useful a passport to influence with them as they are in a modern democracy; while it was in accordance with their restless spirit of intellectual curiosity that the *theory* of speaking received from them more attention than it does in modern communities in which its practice is no less important. Several 'Arts of Speech' had been writt'en before Aristotle's time; he complains, however, that they had all neglected the argumentative element in oratory and had attended to extraneous matters such as the production of emotion in the hearers. He himself recognises the part played by the appeal to emotion, but insists that the emotion must be produced by the speech itself and not by the cheap adventitious devices common in the Greek law-courts.[1] In fact, he connects this defect of previous writers on oratory with their pre-occupation with the oratory of the courts rather than with the more noble political branch of the art. In both these respects he undertakes to improve upon his predecessors.[2] The argumentative element in oratory is emphasised at the outset and throughout. Rhetoric is described as a counterpart or a branch of dialectic.[3] Its connexion is with dialectic rather than with scientific demonstration; like the former it deals with arguments which do not presuppose the knowledge of any particular science but can be used and followed by any intelligent man. In principle oratory, like dialectic, can discuss any subject whatever, but in practice it is for the most part confined to the subjects about which men *deliberate*, and thus it is connected with another

[1] E.g. the introduction of weeping widows and orphans.
[2] *Rhet.* I. 1.
[3] 1354 a1, 1356 a30.

science besides logic; it is 'an offshoot of dialectic and of the study of character which may properly be called politics,'[1] taking its form from the first and its matter from the second.

Rhetoric is 'the power to see the possible ways of persuading people about any given subject.'[2] Persuasives are of two kinds—the extra-technical which already exist and have only to be used (such as witnesses, the torture, documentary evidence), and the technical, which have to be invented by the speaker. Of the latter there are three sub-species, those bearing on the *character* of the speaker (i.e. devices of speech by which he induces his hearers to form a favourable opinion of his character), those which consist in the arousing of *emotion* in the hearers, and those which produce proof or its appearance by sheer force of *argument*. The third kind of persuasive is considered first. It has two main sub-species—example, the rhetorical counterpart of induction, and enthymeme, the rhetorical counterpart of syllogism.[3] Of these the latter is the rhetorical method par excellence, 'the body of persuasion.'[4] 'Arguments by example are no less persuasive, but enthymemes win more applause.'[5] The mode of argument to be used is of course dictated by the conditions under which the orator works. Now the subjects he has to deal with are the sort of things we deliberate about, in so far as these fall outside the scope of the definite arts and sciences; and the people he has to address are people who cannot follow a long train of reasoning. He will therefore deal with probabilities (since certainties are not matters of deliberation), and he will use short trains of reasoning, taking premises for granted when they are likely to be admitted rather than deducing them from first principles.

Enthymemes are of two main kinds. There are the specific arguments dealing with the subject-matter of some science, e.g. ethics or physics, and the general arguments drawn from the *τόποι*, literally the places in which arguments are to be found, the regions, as it were, which they haunt. In proportion as a speaker uses specific arguments, he is deserting the province of rhetoric; but in view of the comparatively small number of general arguments available Aristotle allows the speaker to use specific arguments as well, and proposes to discuss these

[1] 1356 a25. Aristotle's conception of rhetoric owes much to Plato's definition of it in the *Phaedrus* as a philosophical science founded on dialectic and on psychology.

[2] 1355 b26.

[3] Cf. p. 41.

[4] 1354 a15.

[5] 1356 b22.

first. In view of the conditions under which the speaker works, they will mostly be drawn from ethics and politics.[1]

But first he distinguishes three branches of rhetoric. The hearer may be either a spectator or a judge, and a judge of acts either in the past or in the future. Thus there is (1) the oratory of the counsellor, showing some *future* course to be *expedient* or harmful; (2) that of the advocate, showing some *past* act to be *legal* or illegal; (3) ' show ' oratory, whose object is to show the *nobility* or baseness of something treated as existing in the *present*. The political speaker, Aristotle remarks with grave irony, may admit that the course he advocates is unjust, but he must on no account admit that it is inexpedient; the advocate may allow that his client has behaved harmfully, but never that he has broken the law; the panegyrist may admit that the subject of his eulogium is unmindful of his own interest, but must at all costs claim for him moral rectitude.[2]

Aristotle proceeds to indicate the sorts of argument appropriate in political oratory (I. 4–8), in declamation (I. 9), and in pleading in the law-courts (I. 10–14), with an appendix on the ' extra-technical ' proofs already mentioned (I. 15). The substance of these chapters is a sort of popular political and moral philosophy which is sometimes interesting for purposes of comparison with his scientific views expressed elsewhere (e.g. the forensic section throws light on the doctrines of the *Ethics* about responsibility and justice); but Aristotle is careful to point out the purely popular character of what he here says about such subjects. ' In so far as anyone tries to construct either dialectic or rhetoric not as a knack but as a science, he will unconsciously destroy their nature by passing over, in his attempt to reconstruct them, into sciences of definite subject-matters, and not of mere words.'[3] The last chapter gives an amusing and perfectly cynical account of various tricks of the advocate's trade such as the appeal from written to unwritten law; it illustrates perhaps better than any other passage the characteristic of rhetoric which Aristotle has duly noted, that it ' proves opposites.'[4]

[1] I. 2. *τόπος* is defined as ' that under which many enthymemes fall ' (1403 ᵃ19). *τόποι* are also called *στοιχεῖα*, ' the constituent elements of argument ' (*ib.*). Cicero and Quintilian compare them to the haunts of game, to veins or mines where metals may be looked for, and to stores which may be drawn upon (Cic. *Top.* 2. 7; *de Or.* II. 34. 147, 41. 174; *de Fin.* IV. 4. 10; Quint. V. 10. 20–22).

[2] I. 3. [3] 1359 ᵇ12–16. [4] 1355 ᵃ29–36.

So far he has been dealing with the 'specific proofs' drawn from ethics and politics.[1] Instead of proceeding, as might be expected, to the 'commonplaces' of argument, he now turns to the other main persuasives—those by which the speaker conveys a favourable impression of his own *character* (II. 1), and those by which he arouses various *emotions* in his hearers (II. 2–11); we do not reach the commonplaces till ch. 18. Chs. 12–17 form a section dealing with 'character' in a different way from that in which it has hitherto been referred to. It treats of the characters to be expected in hearers in view of their youth or age and of their position in respect of the gifts of fortune—characters to which the speaker will naturally adapt his way of speaking, so as to produce in his hearers the *emotions* he wishes to produce; this section is thus subsidiary to that which precedes it. In chs. 18 and 19 Aristotle comes at last to the 'commonplaces' of oratory, the 'regions' within which the most general arguments are to be found. These are four in number—'the possible and impossible' and 'the future,' specially appropriate to political oratory; 'the past,' specially appropriate to forensic speech; and 'magnitude' (including comparative magnitude), specially appropriate to declamation. Each of these regions yields a variety of general arguments; e.g. 'if a thing is possible, its contrary is also possible'; 'if a thing is possible, its like is also possible'; 'if what is harder is possible, so is what is easier.' Aristotle next turns to something still more general, the 'common persuasives' or forms into which all rhetorical argument whatever falls, example (ch. 20) and enthymeme (chs. 21–24). The latter includes the γνώμη or general moral sentiment, which is the major premise or the conclusion of a syllogism with the rest left unexpressed. In ch. 23 we find a fresh set of τόποι, twenty-eight in number, quite distinct from the four mentioned in chs. 18 and 19. The relation of these two sets to one another is something of a puzzle, which can perhaps best be explained by supposing the *Rhetoric* to represent the notes for more than one course of lectures. The topics of ch. 23 are a selection from those enumerated in the *Topics*—there is the topic of 'contraries,' that of 'similar inflexions,' that of 'relative terms,' that of '*a fortiori*,' etc. We have also (ch. 24) a list of fallacies akin to that in the *Sophistici Elenchi*. Finally there is an account of the modes of refutation

[1] But he incidentally applies the τόπος of 'comparative magnitude' to expediency in I. 7 and to justice in I. 14; cf. 1393 ^{a}8–16.

(ch. 25), and an appendix setting aside two possible misconceptions (ch. 26).

The second book ends and the third begins with an entirely new division of the contents of the art of rhetoric, into the material of persuasion (i.e. the subjects hitherto dealt with—argument, character, emotion), style, and arrangement. This looks like a piece of patchwork, and Diels has argued [1] with much probability that the third book was originally an independent work on style and arrangement, which Aristotle later tacked on to the two books on the subject-matter of oratory.

Style is treated of in chs. 2–12, arrangement in chs. 13–19. Elocution, the management of the voice as regards loudness, pitch, and rhythm, is first briefly dismissed as extra-technical and as being necessary only owing to the vulgarity of audiences. With regard to style, Aristotle points out that the early rhetoricians had imitated the diction of the poets, but that prose style is essentially different from that of poetry. It is peculiarly absurd, he adds, for prose-writers to imitate the diction of poetry just when the poets themselves have adopted a style more conformable to that of ordinary speech.[2]

The essential virtues of style are that it should be in the first place clear, and in the second appropriate, i.e. neither mean nor pompous. Aristotle first considers the bearing of this on the choice of words. Clearness is secured by using the ordinary, straightforward word for expressing your thought, but something more than this is required; to avoid meanness you must introduce something of the ornate and exotic, 'for men wonder at what is at a distance from them, and the wonderful is pleasant.'[3] But prose does not admit so much of this as poetry, since its theme is lower; even in poetry we do not like stilted language in the mouth of a slave or a very young man. You must lower or raise your tone in accordance with the dignity of your subject, and you must do this unobserved. Your speech must seem natural, just as a supreme actor's voice always seems to be that of the character he is playing. Aristotle notes Euripides' exquisite power of producing a poetical effect by careful selection of the commonest words. The unusual words, the compound words, the coined words of poetry must be avoided; only what everyone uses—ordinary words and metaphors—must be used by the orator.[4] At all costs the use of ornament which is stale and frigid must be avoided.[5]

[1] *Abhandl. d. K. preuss. Akad. d. Wiss.* 1886.
[2] III. 1. [3] 1404 b 11. [4] III. 2. [5] III. 3.

From the choice of single words Aristotle proceeds to the combination of them into sentences. The headings here are grammatical purity (ch. 5), dignity (6), propriety (7), rhythmical harmony (8), the construction of periods (9), liveliness (10, 11) and the styles suitable to the three divisions of rhetoric—political, judicial, declamatory (12). These chapters contain many acute and true observations, which have since become the commonplaces of works on style; we must be content to note a few points which have perhaps not become so hackneyed. Aristotle insists that prose should be rhythmical without being metrical. Too pronounced a rhythm will seem artificial and will divert attention from the orator's meaning; a speech entirely without rhythm seems a limitless stretch of words. Dactyls and spondees are too lofty for prose; the iambus is too much the rhythm of everyday speech; the trochee is too tripping a measure. Aristotle declares therefore for the pæonic rhythm, which is not the basis of a definite metre and is therefore less noticeable than the other rhythms. He advocates the combination — ⏑ ⏑ ⏑ at the beginning and ⏑ ⏑ ⏑ — at the end of the sentence. In dealing with the larger rhythm of the whole sentence he prefers the compact periodic style to the loosely-knit style of Herodotus. He notes the value of antithesis, balance, and assonance in knitting the sentence into a period with beginning, middle, and end. He recognises the superiority of language which 'brings things before our eyes,' which 'represents things in action.' How much more vivid is 'with all the bloom of youth upon him' than 'a foursquare man'![1]

Turning to the subject of arrangement, Aristotle ridicules the current elaborate division of speeches into parts some of which were in fact peculiar to certain classes of speech. The essential parts are two—to state your case, and to prove it. But he is willing to admit at most Isocrates' division of the speech into exordium, statement of the case, proof, peroration. These are dealt with in the following chapters with reference to all three kinds of oratory—political, judicial, declamatory; exordium in chs. 14, 15, statement in 16, proof in 17 (with an appendix on the use of questioning in ch. 18), peroration in 19.

The *Rhetoric* may seem at first sight to be a curious jumble of literary criticism with second-rate logic, ethics, politics, and jurisprudence, mixed by the cunning of one who knows well how the weaknesses of the human heart are to be played upon.

[1] 1411 b24–29.

In understanding the book it is essential to bear in mind its purely practical purpose. It is not a theoretical work on any of these subjects; it is a manual for the speaker. The subject interested the Greeks very deeply. Aristotle was, as he himself says, less of a pioneer here than in some other directions. But his work attained an enormous authority; his doctrines appear over and over again in the works of Greek, Roman, and modern writers on the subject. Much of what he says applies only to the conditions of Greek society, but very much is permanently true. If the *Rhetoric* has now less life in it than most of Aristotle's works, it is probably because speakers are nowadays (and rightly) inclined to rely on natural talent and experience rather than on instruction, and because hearers, though as easily swayed by rhetoric as ever, are rather ashamed of the fact and not much interested in knowing how the trick is done. For these reasons we have dealt very briefly with the book, and have been content to give an account of its general plan which may perhaps help readers to find their way about in it.

Poetics [1]

The *Poetics*, on the other hand, is among the most living of Aristotle's works. None of his works has attracted the attention of a more brilliant company of interpreters, and of none has the meaning been more keenly disputed. And if nothing of his had been left to us but this tiny fragment—on a subject, too, far removed from his main interests—we should still recognise its author as one of the greatest of analytic thinkers.

The term ποιητική has more than one meaning in Aristotle. In its most general sense it includes the useful and the fine arts as opposed to the art of life and to science. In the *Poetics* it has a narrower meaning. It belongs to the genus of 'imitation,'[2] which is coextensive with the fine arts; but it is not the whole of this genus. A distinction is drawn[3] between the arts which imitate by means of colour and shape and those which imitate by the voice, and the latter expression answers roughly to what Aristotle would call poetry as opposed to the plastic arts; but only roughly, for we should have to generalise

[1] The following account of the *Poetics* owes much to Mr. R. P. Hardie's article in *Mind* (N.S.) IV. 350–364.
[2] 1447 ᵃ13–16. [3] *Ib.* 18–20.

'voice' into 'sound' so as to bring in instrumental music, and we should have to generalise still further so as to bring in dancing. What then is it that is common to music, dancing, and what we call poetry, and that leads Aristotle to form them into a single group? He does not tell us, in so many words, but his meaning may be seen by considering the principles on which he subdivides the group. These principles are the means, the objects, and the manner of imitation.[1] (1) The *means* appropriate to the group are rhythm, language, and tune, and what these have in common is temporal succession, as opposed to the spatial extension by which painting and sculpture produce their effects. Visible spatial phenomena of course play their part in drama, but in Aristotle's opinion this is a very subsidiary part;[2] he would, we may conjecture, have thought it no great loss if the actors did their work behind a screen.[3]

Tune never exists without rhythm, and the seven possible combinations of the three means are thus reduced to five. 'Poetry' therefore has the following divisions:—

Rhythm	Dancing.
Language. . . .	Prose-imitation (mimes, Socratic dialogues).
Rhythm + language . .	Elegies, epics.
Rhythm + tune . .	Instrumental music.
Rhythm + language + tune	Lyrics, tragedy, comedy.[4]

It is pointed out that what distinguishes poetry from prose is not metre but its being an 'imitation'; fictitious sketches of character and manners like the mimes are poetry though they are unmetrical, and Empedocles is not a poet though he writes in metre. What then is imitation? Aristotle never tells us. He takes over the word from Plato as part of the stock-in-trade of literary criticism. For Plato art is the attempt to copy reality with literal fidelity and to produce the illusion that your copy *is* reality. And this leads him to condemn art on two grounds. The artist is always pretending to be someone else.

[1] *Ib.* 17.

[2] 1450 ᵇ16–20, 1453 ᵇ3–11, 1462 ᵃ10–13, 17.

[3] If we take account of the wider sense of 'rhythm' in which it is distinguished from metre, and it is said that even prose should have rhythm (*Rhet.* 1408 ᵇ30), rhythm is the means common to all that A. calls poetry.

[4] 1447 ᵃ23–ᵇ29.

If he describes a battle, he is falsely claiming to know how battles should be fought. If he puts words into Achilles' mouth, he is pretending to be Achilles. 'Life, in Plato's state,' it has been well said,[1] 'was divided into sections, like the squares upon a chessboard; and justice, the characteristic virtue of his community, was to move on your own squares, and never trespass upon your neighbour's. But the poet is a trespasser.' And secondly, the artist never imitates reality directly; he imitates sensible things, which are but the faint shadows of reality. Aristotle does not explicitly controvert this view, but he supplies materials for its correction. What art imitates is 'characters and emotions and actions' [2]—not the sensible world, but the world of man's mind. Of all the arts the least imitative, that which can least be charged with merely trying to duplicate something already existing, is music; but for Aristotle it is the most imitative.[3] This can only mean that it is the most expressive, that which most successfully embodies emotion, or (to speak more strictly, since emotion exists only in souls) which most effectively arouses in others emotions akin to those felt or imagined by the artist. The same conclusion follows if we consider the difference of the means adopted by different arts. All the poetic arts imitate action, but drama evidently *reproduces* it much the most completely, and if the others aimed at reproduction they would be wasting their time in using such inferior means. Once more, the famous saying that 'poetry is something more philosophic and of graver import than history, since its statements are of the nature rather of universals, whereas those of history are singulars'[4] points the same lesson. Poetry does not aim at reproducing an individual thing, but at giving a new embodiment to a universal truth. There is, of course, danger in this notion of poetry as universal. It easily degenerates into the view that it should present general types of character denuded of the individual traits which make both real people and fictitious characters interesting and delightful. Aristotle's doctrine has often been so interpreted. But to interpret him so is to think of the universal simply as that which 'can be predicated of more things than one'[5] and to forget that for Aristotle the universal is the necessary.[6] History describes events in which the necessary sequence of effect on cause is

[1] Prickard, *A. on the Art of Poetry*, 33.
[2] 1447 ^{a}28.
[3] *Pol.* 1340 ^{a}18–^{b}19.
[4] 1451 ^{b}5–7.
[5] E.g. *De Int.* 17 ^{a}39.
[6] E.g. *An. Post.* I. 6.

obscured by a thousand casual interventions; poetry, and particularly tragedy, depicts the inevitable dependence of destiny on character. We shall see that on the whole Aristotle is true to this principle in his consideration of tragedy. Yet he does not entirely shake off the influence of the term 'imitation.' If he had, he would probably have chosen another word. And we shall see evidences of its ill effect on his thought.

We must return to his division of poetry into its kinds. (2) The second principle of division is this. The imitator imitates men in action, and these either above, on, or below the level of ordinary human nature.[1] This is an independent principle dividing each of the previously recognised kinds of poetry into three. Its chief value for Aristotle is that it enables him to distinguish tragedy, the depiction of good characters, from comedy, the depiction of bad.[2] He will later refine on this account. Comedy depicts men worse than the average 'not as regards any and every sort of fault, but only as regards one particular kind, the ridiculous, which is a species of the ugly; the ridiculous may be defined as a mistake or deformity not productive of pain or harm to others.'[3] And tragedy depicts characters good indeed, but not so much above ourselves as to lose our sympathy.[4] And further, within each kind of poetry there are practitioners who depict higher and others who depict lower types of character.[5]

This classification of the characters depicted in poetry as good or bad indicates how much Aristotle is influenced by the moralistic tendency in æsthetic criticism which is always the earliest to emerge and is particularly strong in Plato. Aristotle admits bad characters in drama, but only when they are necessitated by the plot,[6] and only in subordinate rôles. He has no conception of the possibility of a hero who like Macbeth or Richard III or Satan wins our interest by sheer intensity. His thought is of course conditioned by the traditions of Greek drama; but a character like that of Clytemnestra might, if he had sufficiently considered it, have led him to substitute 'greatness' or 'intensity' for 'goodness.'

(3) Thirdly, imitations—but clearly this applies only to those which use language, to poetry in *our* sense—are divided into the narrative and the dramatic.[7] This furnishes a distinction between epic and drama additional to and more important than

[1] *Poet.* ch. 2. [2] 1448 a16–18. [3] 1449 a32–35. [4] 1453 a7–8. [5] 1448 a11–16, 1460 b33–35. [6] 1454 a28, 1461 b19–21. [7] Ch. 3.

that supplied by the first principle of division; in drama action is imitated by action.

Aristotle next[1] traces the origin of poetry, and of drama in particular. Poetry owes its origin to two primitive instincts—the instinct to imitate, and the instinct to delight in imitations made by others. We delight in them—and the remark indicates Aristotle's freedom from a purely duplicative notion of imitation—even when the things imitated are in themselves painful. Aristotle explains this second instinct, in too intellectualistic a way, as a form of the instinct to seek knowledge, which is the beginning of all mental progress; the pleasure, we are told, lies in recognising what the work of art is meant to represent. But incidentally he lights on another and an equally important source of the pleasure we take in works of art—the sensuous delight in such things as colour, tune, and rhythm.

Springing from these origins, poetry broke up into kinds according to the differences of character in poets. 'The graver among them would represent noble actions . . . and the meaner sort the actions of the ignoble.' [2] And so on the one hand were produced invectives, on the other hymns, panegyrics, and epic. Ultimately the two streams of movement culminated in comedy and tragedy respectively, 'because these new modes of art were grander and of more esteem than the old.' [3] More precisely, tragedy and comedy arose from the introduction of an improvised spoken part in connexion with dithyrambs and phallic songs respectively. The early connexion of tragedy with the dance is also noted.

Epic poetry and tragedy agree in being imitations 'of serious subjects in a grand kind of verse'; [4] they differ in that (1) epic is in a single kind of verse and in narrative form, and (2) epic has no fixed limit of time, whereas tragedy 'endeavours to keep as far as possible within a single circuit of the sun, or something near that.' [5] Aristotle is here taking account of the actual difference of length, in Greek as in later practice, between drama and epic, and deriving it from the greater duration of the action depicted. This passage, Aristotle's supposed statement of the 'unity of time,' does not state a canon of his own but merely a historical fact about the practice of the Greek drama—though he would doubtless have thought unity of time conducive to the 'unity of action' which is the only

[1] Ch. 4. [2] 1448 b25. [3] 1449 a5.
[4] b9 (Bywater's reading). [5] b12.

unity he insists on.[1] The reference to the 'unity of place' is equally slight; [2] he merely says that tragedy cannot represent actions which happen *simultaneously* in different places. Thirdly (3) epic and drama differ also in their constituents. Drama uses the means of tune in addition to the rhythm and language used by epic.

Aristotle now proceeds[3] to define tragedy. It is 'the imitation of an action that is good and also complete in itself and of some magnitude; in language with pleasurable accessories, each kind brought in separately in the parts of the work; in a dramatic, not in a narrative form; with incidents arousing pity and fear wherewith to accomplish its purgation of such emotions.' With parts of this definition we are already familiar—with the genus (imitation) and with the differentiae referring to the object, means, and manner of imitation; 'language with pleasant accessories' is explained as meaning 'language + rhythm + tune.' 'Each kind brought in separately in the parts of the work' refers to the fact that tragedy, unlike the dithyramb, uses tune only in the choral parts.[4] These differentiae are enough to distinguish tragedy from all other forms in Greek and probably in any literature, but Aristotle adds other characteristics. (1) The action represented must be complete, i.e. it must have beginning, middle, and end. It must not be the sort of composition in which one can see no reason why it should begin or end where it does.[5] It must have a beginning which is comparatively intelligible in itself and does not forcibly provoke the question 'how did this come to be'; an end which is satisfying and does not provoke the question 'and then?'; and a middle which is necessitated by the beginning and necessitates the end. And further (2) it must have a certain magnitude.[6] Aristotle is always sure that each thing, whether it be a ship, a city, or a work of art, has an appropriate limit of size. In particular, beauty depends on size; if the object be too small, 'our perception becomes indistinct as it approaches instantaneity'; if too large, 'the unity and wholeness of it is lost to the beholder.' As a beautiful visible whole must be of a size to be taken in by the eye, a good tragic plot must be of a length to be taken in by the memory. The arousing of interest being cumulative, the action must have a certain length in order to arouse our interest to the full; it must not go beyond a certain length, or interest will be

[1] Chs. 8–11. [2] 1459 b22–26. [3] Ch. 6.
[4] Cf. 1447 b27. [5] 1450 b23–34. [6] 34–1451 a15.

dissipated through fatigue. This differentia marks tragedy off from the slight improvisations out of which it historically arose; but at the same time it distinguishes good tragedy from bad. The two differentiae together are interesting, because it is here that Aristotle most explicitly refers to the formal conditions of the beauty at which the dramatist, like every other artist, is assumed to aim. Of the three conditions of beauty mentioned elsewhere,[1] 'symmetry' is omitted, perhaps as more appropriate to the plastic arts. The condition with regard to beginning, middle, and end is identified with 'order.'[2] And in the rule with regard to size we may recognise the third condition, 'limitation.' (3) To be complete, the definition must mention the final cause of tragedy, and this Aristotle does by naming purgation as its aim. A whole library has been written on this famous doctrine. The main opposition is between the views which take *κάθαρσις* to be a metaphor drawn from ceremonial purification, and the object of tragedy to be a moral one, the purification of the emotions, and those which take *κάθαρσις* to be a metaphor drawn from the purgation of evil bodily humours,[3] and the object assigned to tragedy to be non-moral. The former view has the support of many famous names, and is chiefly associated with that of Lessing. The latter view found support as early as the Renaissance and has been placed almost beyond dispute by the arguments of Bernays.[4]

We may distinguish a direct and an ulterior object of tragedy. Its direct object is to arouse pity and fear, pity for the past

[1] *Met.* 1078 a36. [2] 1450 b35.

[3] The comparison of the effect of poetry to the expulsion of evil humours by medicine is as old as Gorgias (*Hel. Enc.* 8–14). But he has no doctrine of the expulsion of passion *by its arousal.*

[4] Milton expresses an intermediate view. 'Tragedy, as it was anciently composed, hath been ever held the gravest, moralest, and most profitable of all other poems; therefore said by Aristotle to be of power, by raising pity and fear, or terrour, to purge the mind of those and such-like passions; that is to temper or reduce them to just measure with a kind of delight stirred up by reading or seeing those passions well imitated. Nor is Nature herself wanting in her own effects to make good his assertion, for so, in physick, things of melancholick hue and quality are used against melancholy, sour against sour, salt to remove salt humours' (*Pref.* to *Samson Agonistes*). Cf.—

'His servants he, with new acquist
Of true experience, from this great event
With peace and consolation hath dismissed,
And calm of mind, all passion spent' (*Samson Agon.* ad fin.).

On the origin of Milton's view cf. Bywater in *J. of P.* XXVII. 267–275.

and present sufferings of the hero, fear for those which loom before him. It has sometimes been thought, on the strength of passages in the *Rhetoric*,[1] that while the spectator's pity is for the hero, his fear is for himself—fear lest a like fate should befall him.[2] But no ordinary spectator is likely to fear the fate of, for instance, Aristotle's typical hero Œdipus. To make sense of this hypothesis, the fear has to be generalised into a vague fear of the unknown fate that lies before each of us; but of this there is no trace in Aristotle. In fact he directly says that the fear is for the hero.[3] True, in order that we should feel it the hero must be 'like ourselves,' but this is because without some degree of likeness we cannot feel sympathetic fear for him.

That tragedy arouses pity and fear is a matter of common knowledge, and was one of the main bases of Plato's attack on it; by stimulating emotion, he said, tragedy makes us more emotional and weak. Aristotle implicitly answers him by saying that the further effect of tragedy is not to make us more emotional but to purge away emotion. That this is the meaning of *κάθαρσις* is shown by two passages in the *Politics*[4] in which Aristotle describes certain kinds of music—called 'orgiastic' or 'enthusiastic' in opposition to others which are 'ethical' or else 'practical' (i.e. imitative of character or of action)—as aiming not at instruction nor at relaxation, but at *κάθαρσις*. 'For the feeling which takes a violent form in some souls exists more or less in all—e.g. pity and fear, and again enthusiasm. For to attacks of this emotion also some are liable, but as a result of the sacred melodies we see them—when they have felt the influence of the melodies that excite the soul to mystic frenzy—restored as though they had found *healing and purgation*. This same treatment, then, must be applied to those who are specially liable to pity or fear or in general to emotion, and to all others in so far as each is susceptible to such emotions; all need to be in a manner purged and their souls lightened and *delighted*. Just in this way the purgative melodies also give an innocent *pleasure* to mankind.' This passage further refers to the *Poetics* for a fuller account of *κάθαρσις*; the reference is doubtless to the missing second book.

Three things are to be noted here—(1) that cathartic melodies are distinguished from those which are ethical and aim at

[1] 1382 b26, 1386 a26.
[2] Lessing, *Hamb. Dram. St.* 75.
[3] 1453 a5.
[4] 1341 a21–25, b32–1342 a16.

'instruction,' i.e. at improvement of character. This is itself almost enough to refute those who make Aristotle's account of tragedy a moralistic one involving the purification of the passions. The aim under which that of tragedy is subsumed is pleasure. The fine arts in general are among those which aim at pleasure, in distinction from the useful arts which produce the necessaries of life and from the sciences which aim at knowledge.[1] But the pleasure arising from *κάθαρσις* is a specific one, distinct from that of mere relaxation and amusement.[2] The tragic poet must aim at producing the pleasure aroused by relief from pity and fear, and no other. Whether Aristotle definitely recognised æsthetic pleasure as a species included under pleasure in general, and including the pleasures produced by the various arts, is doubtful. (2) The language is medical, and more clearly seen to be medical the more closely it is examined in connexion with Aristotle's biological works and the Hippocratean writings.[3] (3) Aristotle's usage elsewhere shows that 'the purgation of such emotions' probably means 'the removal of them,' not (as has more usually been supposed) 'the removal of the inferior elements in them.' But it does not mean the entire removal of them; Aristotle would not think it good for a man to be entirely freed from all tendency to fear or to pity; 'there are things which we ought to fear,'[4] and things which we ought to pity. It means 'the removal of them in so far as they are in excess.' There is nothing in the medical associations of *κάθαρσις* that forbids this interpretation, and common sense is in its favour.

The process hinted at bears a strong resemblance to the 'abreaction,' the working-off of strong emotion, to which psycho-analysts attach importance. There is this difference, however, that what they try to bring about in abnormal cases Aristotle describes as the effect of tragedy on the normal spectator. Do most men in fact go about with an excessive tendency to pity and fear? And are they in fact relieved by witnessing the sufferings of the tragic hero? That we somehow benefit by seeing or reading a great tragedy, and that it is by

[1] *Met.* 981 b21, cf. *Poet.* 1448 b13, 18, 1460 a17, 1462 a16, b1.

[2] *Pol.* 1341 b38–41, 1342 a16–28; *Poet.* 1453 a35, b10, 1459 a21, 1462 b13.

[3] There are several passages in ancient literature which confirm this interpretation; Plut. *Qu. conv.* 3. 8. 657 A, Arist. Quint. *De Musica* 3. 25 (p. 13 Jan), Iambl. *De Myst.* 1. 11, 3. 9 (ed. Parthey), Proclus in Plat. *Remp.* 1, pp. 42, 49 f., Kroll.

[4] *E.N.* 1115 a12.

pity and fear that it produces its effect, is beyond doubt; but is not the reason to be found elsewhere? Is it that people *deficient* in pity and fear because their lives give little occasion for such feelings are for once taken out of themselves and made to realise the heights and depths of human experience? Is not this enlarging of our experience, and the accompanying teaching of 'self-knowledge and self-respect,'[1] the real reason of the value which is placed upon tragedy? Aristotle's account is probably true of natures which tend to be constantly oppressed by the dark side of human life. And it is not quite the ordinary man that he has in view, for the ordinary man likes happy endings, which Aristotle rates low.[2]

From the definition of tragedy Aristotle passes to enumerate its elements. These are, in order of importance, the following:—(A) elements involved in the object represented—Plot, Character, Thought; (B) elements involved in the means of representation—Diction (including the two means formerly described as language and rhythm), Melody, (C) the element involved in the manner of representation—Spectacle (with special reference to the make-up of the actors). Aristotle is at pains to show that plot is more important than character and thought, and this has provoked the criticism of those who hold character to be the chief element in a play (or in a novel). Plot (it is argued), if divorced from character and thought, is reduced to a set of movements performed by persons of no particular moral or intellectual quality; and such a plot—an intrigue carried on by lay figures—has no artistic value. The antithesis is surely an absurd one. How could the creatures of the stage go through their evolutions without some sort of purpose and some degree of intelligence being implied in what they do? And how can character be manifested without *some* plot? We must not push the abstraction to these extremes. Aristotle's meaning is to be discovered by noting (1) that the opposition between plot and character is an example of that between actuality and potentiality. Character when opposed to plot is just character-in-so-far-as-it-is-inactive, and in accordance with his metaphysical principles [3] Aristotle is bound to give the preference to plot, which is character-in-action.[4] And it is surely true that most playgoers care a great deal more for an interesting plot, even

[1] Shelley, *Defence of Poetry*, in Prose Works (ed. Forman) III. 116 (quoted by E. F. Carritt, *Theory of Beauty*, 140).
[2] 1453 a23–39. [3] *Met.* Θ. 9. [4] 1450 a16–23.

when the characters are commonplace, than for ingeniously or profoundly sketched characters who do nothing in particular. (2) For the most part Aristotle uses 'character' and 'thought' in the *Poetics* of the *revelation* of character and thought in *language.*[1] Now it would be agreed that the most significant dramatic expression of moral and intellectual quality is in *action.* 'Plot' thus absorbs into itself the most important part of character and thought and becomes beyond doubt the chief element in the play. 'Character' and 'thought' become the merely supplementary revelation in speech of what is best revealed in action; 'thought' is expressly said to be more a matter for rhetoric than for the theory of poetry.[2]

With regard to the other elements we may note that Aristotle describes melody as the greatest of the 'sweetenings' of tragedy, i.e. as only an accessory though a very pleasant one, and the 'spectacle' as the most extra-technical[3] of all the elements; he recognises that the tragic effect does not require actual performance of the play. Returning to plot, Aristotle points out[4] that its unity does not consist in its having one man as its subject. Many incidents in a life are irrelevant to one another. 'The story . . . must represent one action, a complete whole, with its several incidents so closely connected that the transposal or withdrawal of any one of them will disjoin and dislocate the whole.'[5] This is the one unity which Aristotle prescribes, and no better prescription could possibly be given. Thus 'the poet's function is to describe, not the thing that has happened, but the kind of thing that might happen.'[6] It is in this sense, with reference to its internal unity and not to generality, that Aristotle describes poetry as saying things more universal than what history tells us.[7] Tragedy adheres to the historic names only because what has happened before obviously *can* happen and for that reason carries conviction; and in point of fact it sometimes departs with success from this tradition.

So far Aristotle has been explaining what is meant by calling tragedy the imitation of a complete action. But it is also an

[1] 1450 ^{a}6, 29, ^{b}5, 9, 11, 1456 ^{a}36. Cf. particularly 1450 ^{b}8. 'Character in a play is that which reveals the moral purpose of the agents . . . where that is not obvious,' i.e. from the action. Only in 1454 ^{a}18 does character 'include the revelation of character in action.'

[2] 1456 ^{a}34–36, cf. 1450 ^{b}6–8.

[3] Cf. the *ἄτεχνα* in the *Rhetoric*, 1355 ^{b}35, 1404 ^{a}16. Spectacle here answers to elocution there.

[4] 1451 ^{a}16. [5] *Ib.* 31–34. [6] *Ib.* 36. [7] ^{b}6.

imitation of incidents arousing pity and fear. Such incidents have the greatest effect 'when they occur unexpectedly and at the same time in consequence of one another.'[1] Incidents of this kind may be summed up under the heads of 'reversal of fortune' and 'discovery,' the two characteristics of a complex as opposed to a simple plot.[2] Every true tragedy implies, indeed, a change from happiness to unhappiness or from unhappiness to happiness; by 'reversal of fortune' Aristotle means such a change within the limits of a single act or scene, as in the *Œdipus Tyrannus* when the messenger reveals Œdipus' parentage. The third special element in plot to which Aristotle calls attention is 'suffering,' i.e. murders, tortures, and the like performed on the stage.[3]

The best tragedy, he assumes,[4] will be complex in the sense defined. Three kinds of plot are to be avoided. 'A good man must not be seen passing from happiness to misery, or a bad man from misery to happiness. The first situation is not fear-inspiring or piteous, but simply odious to us. The second is the most untragic that can be . . . it does not appeal either to the human feeling in us, or to our pity, or to our fears. Nor on the other hand should an extremely bad man be seen falling from happiness into misery. Such a story may arouse the human feeling in us, but it will not move us to either pity or fear; pity is occasioned by undeserved misfortune, and fear by that of one like ourselves.'[5] The proper tragic hero, then, is 'the intermediate kind of personage, a man not pre-eminently virtuous and just, whose misfortune, however, is brought upon him not by vice and depravity but by some error of judgment [6]—a man, too, who is in the enjoyment of great reputation and prosperity.'[7] Aristotle's preference for this scheme is no doubt partly based on the *Œdipus Tyrannus*, which is as much his favourite drama as the *Antigone* was Hegel's. The scheme is beyond doubt an eminently tragic one; witness, for example, *Othello*. But others are perhaps as good. It is difficult to bring Antigone or Cordelia

[1] 1452 a4. [2] Ch. 10.
[3] Ch. 11. [4] 1452 b30–32. [5] *Ib.* 34–1453 a6.
[6] *ἁμαρτία* must, it appears, be confined to error of judgment. *ἁμάρτημα* is used in that sense, *E.N.* 1135 b12–18, *Rhet.* 1374 b6; and *ἁμαρτία* is often used of intellectual error. It is sometimes used of defects of character (*E.N.* 1115 b15, 1119 a34, 1148 a3), but that meaning seems to be here precluded by *δι᾽ ἁμαρτίαν μεγάλην* 1453 a15. A *great* defect of character could hardly be opposed to *μοχθηρία*.
[7] 1453 a7–10.

under it [1]; they belong rather to the first of the types which Aristotle rejects—rejects, indeed, not as bad but as not the best. And Macbeth and Richard III. seem to show that the third type rejected by Aristotle can be as tragic as any, while Coriolanus and Antony, Hamlet and Lear show the downfall of noble characters through faults of will rather than of judgment.

Aristotle proceeds [2] to specify the kind of situation most calculated to inspire pity or fear. The person who plans or does the tragic deed must be a friend or relative of him to whom it is (or is to be) done, not an enemy nor indifferent to him. In the ideal plot he will plan the deed in ignorance of the relation, and discover the relation just in time.

Six forms of 'discovery' are enumerated,[3] and the palm is given to that which arises not from any 'artifice of signs and necklaces,' but 'when the great surprise comes about through a probable incident,'[4] as in the *Œdipus Tyrannus* and the *Iphigenia in Tauris*. In showing the importance of the poet's putting himself in the place of his characters, Aristotle throws out an interesting division of poets into two kinds. 'Poetry demands a man with a special gift for it, or else one with a touch of madness in him; the former can easily assume the required mood, and the latter may be actually beside himself with emotion.'[5] We have here something not unlike the classical and the romantic type, or in Nietzsche's language the Apolline and the Dionysiac; and it is much to be regretted that Aristotle does not develop the suggestion. Another interesting classification is that of tragedies into tragedies of reversal of fortune and discovery, tragedies of suffering, those of character, and those of spectacle. As far as possible, all these elements of interest should be combined.[6] The folly of attempting to pack the whole of an epic story into one tragedy is well pointed out.[7]

With regard to 'character' four rules are laid down.[8] The characters must be good (though, as we have seen, not too good); they must be appropriate—e.g. to their sex; they must be like the legendary original; they must be consistent

[1] Hegel's attempt to show that Antigone's fate springs from her own fault is surely mistaken. In tragedy, as in real life, human fortunes are often so interlocked that people suffer for the faults of others; and the theme is none the less tragic for that.

[2] Ch. 14. [3] Ch. 16. [4] 1455 ^{a}16–20.

[5] ^{a}32–34. [6] ^{b}32–1456 ^{a}4. [7] 1456 ^{a}10–19. [8] Ch. 15.

even if it be only in inconsistency. Above all, in character as in plot the necessary or the probable must be aimed at; speech and action must flow from character. For the proper way of indicating the 'thought' of the persons of the drama Aristotle refers us to the *Rhetoric*.[1] What he has to say about 'diction' is partly an interesting analysis of the 'parts of speech,'[2] partly a number of suggestions[3] as to how poetry is to combine clearness with dignity by a judicious admixture of ordinary language with unusual forms, and above all with metaphor. 'This is the one thing that cannot be learnt from others; and it is also a sign of genius, since a good metaphor implies an intuitive perception of the similarity in dissimilars.'[4]

A true feeling for the characteristics of different literary forms is shown by the chapters in which Aristotle compares epic poetry with tragedy. The two are alike in the necessity for unity of action, which marks them both off from history;[5] alike too in that they have the same species—simple and complex, stories of character and stories of suffering, etc.—and the same elements, except that epic dispenses with song and with spectacle. They differ (1) in length. While the same general principle holds good, that the work must be capable of being taken in at one view, epic can run to greater length, since the narrative form enables it to describe a number of simultaneous incidents. This gives the epic 'grandeur, and also variety of interest and room for episodes of diverse kinds,'[6] such as tend to ruin drama by force of satiety. They differ (2) in metre. Nature herself has taught epic poetry to use 'the gravest and weightiest of metres—which makes it more tolerant than the rest of strange words and metaphors.'[7] (3) The epic 'affords more opening for the improbable, the chief factor in the marvellous, because in it the agents are not visibly before one. The pursuit of Hector would be ridiculous on the stage . . . but in the poem the absurdity is overlooked.'[8] Yet, even in epic, improbabilities are justified only if they serve the end of poetry itself by making the effect more astounding.

Which of the two, then, is the higher art?[9] Current opinion placed tragedy lower than epic because of the vulgar overacting which had become the fashion. Aristotle rules this objection out as irrelevant, and gives the palm to tragedy on

[1] 1456 ᵃ34. [2] Chs. 20, 21. [3] Ch. 22. [4] 1459 ᵃ6–8.
[5] Ch. 23. [6] 1459 ᵇ28–30. [7] ᵇ34–36.
[8] 1460 ᵃ12–17. [9] Ch. 26.

the following grounds. (1) It is a richer form than the epic because music and the spectacle add to the effect. (2) It has a greater vividness even when read. (3) It attains its effect with greater concentration. (4) It has greater unity of action. And (5) it produces more completely the specific effect of poetry —the pleasure that arises from pity and fear.

Tragedy and epic are the only forms of poetry of which much is said in the *Poetics*. There is a chapter on the history of comedy,[1] and its nature seems to have been discussed in the missing second book. The chief other matter contained in that book was the full account of *κάθαρσις* which we should give so much to have; comedy was probably described as effecting a purgation of the tendency to laughter as tragedy does of that to pity and fear. Of lyric poetry only the dithyramb and the nome are mentioned, and these but incidentally; Aristotle no doubt held the lyric to belong to the theory of music rather than to that of poetry. The *Poetics* is therefore far from being a theory of poetry in general, still less a theory of fine art. No complete or even entirely consistent æsthetic theory can be elicited from it. Yet it contains perhaps a greater number of pregnant ideas on art than any other book. It marks the beginning of the deliverance from two mistakes which have over and over again marred æsthetic theory—the tendency to confuse æsthetic with moral judgments, and the tendency to think of art as duplicative or photographic of reality. There is clearly implicit in Aristotle's words the recognition of beauty as good independent of material and of moral interests alike; but he has not succeeded in working his way to a definite statement of its nature.

[1] Ch. 5.

SHORT BIBLIOGRAPHY

GENERAL WORKS ON ARISTOTLE

G. Grote: *Aristotle*, ed. 3. London, 1883.
E. Wallace: *Outlines of the Philosophy of Aristotle*, ed. 3. Cambridge, 1887.
T. Gomperz: *Griechische Denker*, vol. 3. Leipzig, 1902. Eng. Tr., vol. 4. London, 1912.
T. Case: art. "Aristotle" in *Encyclopædia Britannica*. Cambridge, 1910.
F. Brentano: *Aristoteles und seine Weltanschauung*. Leipzig, 1911.
C. Piat: *Aristote*, ed. 2. Paris, 1912.
A. E. Taylor: *Aristotle*, ed. 2. London, 1919.
O. Hamelin: *Le Système d'Aristote*. Paris, 1920.
E. Zeller: *Die Philosophie der Griechen*, II. 2, ed. 4 (Anastatic). Berlin, 1921. Eng. Tr., 2 vols. London, 1897.
C. Lalo: *Aristote*. Paris, 1922.
H. Siebeck: *Aristoteles*, ed. 4. Stuttgart, 1922.
W. Jaeger: *Aristoteles*. Berlin, 1923.
V. Rose: *De Aristotelis Librorum Ordine et Auctoritate*. Berlin, 1854.
V. Rose: *Aristoteles Pseudepigraphus*. Leipzig, 1863.
R. Eucken: *Die Methode der Aristotelischen Forschung*. Berlin, 1872.
British Museum Catalogue of Printed Books: Aristotle. London, 1884.
R. Shute: *On the History of . . . the Aristotelian Writings* . . . Oxford, 1888.
M. Schwabe: *Bibliographie d' Aristote*. Paris, 1896.
J. L. Heiberg: *Mathematisches zu Aristoteles*. Leipzig, 1904.
T. E. Lones: *Aristotle's Researches in Natural Science*. London, 1912.
M. Grabmann: *Forschungen über die Lateinischen Aristotelesübersetzungen des XIII. Jahrhunderts*. Münster, 1916.

GENERAL EDITIONS, TRANSLATIONS, AND COMMENTARIES

Aristotelis Opera. Berlin, 1831–1870. Vols. 1, 2 Text, ed. I. Bekker; and Fragments, ed. V. Rose. Vol. 3 Renaissance Latin translations. Vol. 4 *Scholia*, ed. C. A. Brandis and H. Usener. Vol. 5 *Index Aristotelicus*, ed. H. Bonitz.
Teubner texts of *Topics* and *Sophistici Elenchi*; *Physics*; *De Caelo* and *De Generatione et Corruptione*; *De Anima*; *Parva Naturalia*; *De Spiritu*, *De Motu Animalium*, and *De Incessu Animalium*; *Historia Animalium*; *De Partibus Animalium*; *De Coloribus*, *De Audibilibus*, and *Physiognomonica* (the latter also in Förster's *Physiognomonici Scriptores*); *De Plantis*, *De Mirabilibus Ausculta-*

tionibus, *Mechanica*, *De Lineis Insecabilibus*, *Ventorum Situs et Nomina*, and *De Melisso Xenophane Gorgia* ; *Physical Problems* ; *Musical Problems* (in Jan's *Musici Graeci Scriptores*) ; *Metaphysics* ; *Nicomachean Ethics* ; *Magna Moralia* ; *Eudemian Ethics* and *De Virtutibus et Vitiis* ; *Politics* ; *Oeconomica* ; *Rhetoric* ; *Rhetorica ad Alexandrum* (in Spengel-Hammer's *Rhetores Graeci*, vol. 1) ; *Poetics* ; *Athenaion Politeia* ; *Divisiones Aristoteleae* ; *Fragments*.

S. Maurus : Latin translation, paraphrase, and notes. Rome, 1668, and Paris (4 vols.), 1886–9.

Oxford Translation, ed. J. A. Smith and W. D. Ross. The following parts have appeared—*De Caelo* and *De Generatione et Corruptione* ; *Meteorologica* ; *Parva Naturalia* ; *De Mundo* and *De Spiritu* ; *Historia Animalium* ; *De Partibus Animalium* ; *De Motu* and *De Incessu Animalium* ; *De Generatione Animalium* ; *De Coloribus*, *De Audibilibus*, *Physiognomonica*, *De Plantis*, *Mechanica*, *Ventorum Situs et Cognomina*, and *De Melisso Xenophane Gorgia* ; *De Mirabilibus Auscultationibus* ; *De Lineis Insecabilibus* ; *Metaphysics* ; *Magna Moralia*, *Eudemian Ethics*, and *De Virtutibus et Vitiis* ; *Politics* ; *Oeconomica* and *Athenaion Politeia*. In the press, *Rhetoric*, *Rhetorica ad Alexandrum*, and *Poetics*.

Commentaria in Aristotelem Græca (23 vols.) Berlin, 1882–1909, with Supplementum Aristotelicum (3 vols.), 1882–1903.

LOGIC

Organon : text, Latin trans., and comm., J. Pacius. Frankfort, 1597.

— text and comm., T. Waitz, 2 vols. Leipzig, 1844–6.

Posterior Analytics : Latin trans. and comm., J. Zabarella. Venice, 1582, etc.

— — trans., E. Poste. Oxford, 1850.

Topics : German trans. and notes, E. Rolfes. Leipzig, 1919.

Sophistici Elenchi : text, trans., and comm., E. Poste. London, 1866.

J. Zabarella : *Opera Logica*. Venice, 1578, etc.

H. Bonitz : *Ueber die Categorien des Aristoteles*. Vienna, 1853.

O. Apelt : *Kategorienlehre des Aristoteles* in *Beiträge zur Geschichte der Griechischen Philosophie*. Leipzig, 1891.

F. A. Trendelenburg : *Elementa Logices Aristoteleae*, ed. 9. Berlin, 1892.

H. Maier : *Syllogistik des Aristoteles*, 3 vols. Tübingen, 1896–1900.

PHILOSOPHY OF NATURE

Physics : text, Latin trans., and comm., J. Pacius. Frankfort, 1596, etc.

— Latin trans. and comm., J. Zabarella. Venice, 1600.

— text, German trans., and notes, J. Prantl. Leipzig, 1854.

— Bk. II, Fr. trans. and comm., O. Hamelin. Paris, 1907.

De Caelo, *De Gen. et Corr.*, *Meteor.*, *De Mundo*, *Parva Naturalia* : text, Latin trans., and notes, J. Pacius. Frankfort, 1601.

De Caelo et Mundo : Lat. trans. and comm., St. Thomas Aquinas. Rome, 1884.

De Gen. et Corr. and *Meteor.*: Latin trans. and comm., J. Zabarella. Frankfort, 1600.
De Gen. et Corr: text and comm., H. H. Joachim. Oxford, 1922.
Meteorologica: text, Latin trans., and comm., J. L. Ideler (2 vols.). Leipzig, 1834–6.
— text, F. H. Fobes. Cambridge, Mass., 1919.
J. Zabarella: *De Rebus Naturalibus.* Cologne, 1590, etc.
O. Gilbert: *Die meteorologischen Theorien des griechischen Altertums.* Leipzig, 1907.
P. Duhem: *Le Système du Monde*, vol. I. Paris, 1913.
A. Mansion: *Introduction à la Physique Aristotélicienne.* Louvain and Paris, 1913.

BIOLOGY

Historia Animalium: text, German trans., and comm., H. Aubert and F. Wimmer, 2 vols. Leipzig, 1868.
De Partibus Animalium: trans. and notes, W. Ogle. London, 1882.
De Generatione Animalium: text, German trans., and notes, H. Aubert and F. Wimmer. Leipzig, 1860.
J. B. Meyer: *Aristoteles' Thierkunde.* Berlin, 1855.

PSYCHOLOGY

De Anima: text, Latin trans., and comm., J. Pacius. Frankfort, 1596, etc.
— — Latin trans. and comm., J. Zabarella. Venice, 1605, etc.
— — text and comm., F. A. Trendelenburg, ed. 2. Berlin, 1877.
— — text, trans., and comm., E. Wallace. Cambridge, 1882.
— — text, Fr. trans., and comm., G. Rodier, 2 vols. Paris, 1900.
— — text, trans., and comm., R. D. Hicks. Cambridge, 1907.
De Sensu and *De Memoria*: text, trans. and comm., G. R. T. Ross. Cambridge, 1906.
De Juv. et Sen., De Vita et Morte, De Resp.: trans. and notes, W. Ogle. London, 1897.
A. E. Chaignet: *Essai sur la Psychologie d'Aristote.* Paris, 1883.

METAPHYSICS

Metaphysics: text, German trans., and comm., A. Schwegler, 4 vols. Tübingen, 1847–8.
— text and comm., H. Bonitz, 2 vols. Bonn, 1848–9.
— trans., H. Bonitz. Berlin, 1890.
— text and comm., W. D. Ross, 2 vols. Oxford, in the press.
— Bk. I, trans. and notes, A. E. Taylor. Chicago, 1907.
— Bk. I, French trans. and comm., G. Colle. Louvain and Paris, 1912.
— Bks. II, III, French trans. and comm., G. Colle. Louvain and Paris, 1922.
L. Robin: *Théorie Platonicienne des Idées at des Nombres d'Après Aristote.* Paris, 1908.

W. W. Jaeger: *Studien zur Entstehungsgeschichte der Metaphysik des Aristoteles.* Berlin, 1912.
F. Ravaisson: *Essai sur la Métaphysique d'Aristote*, ed. 2. Paris, 1913.
J. Chevalier: *Notion du Nécessaire chez Aristote et ses Prédécesseurs.* Lyon, 1914.

ETHICS

Nicomachean Ethics: text and comm., A Grant, 2 vols., ed. 4. London, 1885.
— — text, I. Bywater. Oxford, 1890.
— — comm., J. A. Stewart, 2 vols. Oxford, 1892.
— — text and comm., J. Burnet. London, 1900.
— — trans., F. H. Peters, ed. 10. London, 1906.
— — Bk. V, text, trans., and comm., H. Jackson. Cambridge, 1879.
— — Bk. VI, text, trans., and comm., L. H. G. Greenwood. Cambridge, 1909.
— — Bk. X, text and comm., G. Rodier. Paris, 1897.
Eudemian Ethics: text, Latin trans., and comm., A. T. H. Fritzsche. Ratisbon, 1851.

POLITICS

Politics: text, German trans., and comm., F. Susemihl. Leipzig, 1879.
— text and comm., W. L. Newman, 4 vols. Oxford, 1887–1902.
— Bks. I–III, VII, VIII, text and comm., F. Susemihl and R. D. Hicks. London, 1894.
Athenaion Politeia: text and comm., J. E. Sandys, ed. 2. London, 1912.
— — text, F. G. Kenyon. Oxford, 1920.
E. Barker: *Political Thought of Plato and Aristotle.* London, 1906.

RHETORIC AND POETICS

Rhetoric: text, Latin trans., and comm., L. Spengel, 2 vols. Leipzig, 1867.
— text and comm., E. M. Cope and J. E. Sandys, 3 vols. Cambridge, 1877.
— introduction, E. M. Cope. London and Cambridge, 1867.
— trans., R. C. Jebb. Cambridge, 1909.
Poetics: text, Latin trans., and comm., T. Tyrwhitt. Oxford, 1794.
— text and comm., J. Vahlen, ed. 3. Leipzig, 1885.
— text, trans., and essays, S. H. Butcher, ed. 3. London and New York, 1902.
— text, trans., and comm., I. Bywater. Oxford, 1909.
— trans. and notes, T. Twining, ed. 2. London, 1812.
J. Bernays: *Zwei Abhandlungen über die Aristotelische Theorie des Drama.* Berlin, 1880.

SPURIOUS WORKS

De Coloribus: text and comm., C. Prantl. Munich, 1849.
Mechanica: text and comm., J. P. van Cappelle. Amsterdam, 1812.
C. Stumpf: *Pseudo-Aristotelischen Probleme über Musik*. Berlin, 1897.
De Lineis Insecabilibus: German trans. and notes, O. Apelt in *Beiträge zur Geschichte der Griechischen Philosophie*. Leipzig, 1891.
De Melisso Xenophane Gorgia: text, H. Diels. Berlin, 1900.

